Digitized by the Internet Archive
in 2010 with funding from
University of Toronto

http://www.archive.org/details/n5royalsocietyof43roya

RA
421
R6
v. 43
no. 5
cop. 2

Biological
& Medical
Serials

Vol. XLIII. – No. 5. Issued February, 1923.

LIBRARY
MAR 15 1967
UNIVERSITY OF TORONTO

JOURNAL

OF

THE ROYAL SANITARY INSTITUTE

PUBLISHED MONTHLY.

LONDON:
OFFICES OF THE ROYAL SANITARY INSTITUTE,
90, BUCKINGHAM PALACE ROAD, S.W. 1, (TEL.: 3739 VICTORIA).
EDWARD STANFORD LTD., 12, 13, & 14, LONG ACRE, W.C. 2

PRICE ONE SHILLING NET.

Write us for Samples and Prices of

PURE FRESH MADE MEDICINAL COD LIVER OIL

Refined or Unrefined. In Bottles or in Bulk.

PURE FRESH MEDICINAL COD LIVER OIL EMULSION

With or without Hypophosphites. Prepared with Refined or Unrefined Cod Liver Oil. Packed in 4, 6, 8, 10 16 or 20 oz. Bottles. Winchesters or Drums.

EXTRACT OF MALT with COD LIVER OIL

15, 20 or 33⅓% Oil. In composite Cardboard Containers, Lever Lid Tins, ½ and 1 lb. ½ and 1 cwt. drums.

Ask for Samples of our Grimsby Cod Liver Oil Emulsion, prepared as recommended by Eminent Medical Authorities who have visited our works.

: Bronze Medal, Awarded Health Exhibition, Bournemouth 1922. :

FAIRBANK KIRBY (Grimsby) Ltd.
Wholesale Manufacturing Chemists,
GRIMSBY. - - Established 1894.

FOR EFFICIENT SANITATION

INCLUDE

"SCOUT" SOAP

IN YOUR REQUISITIONS

It is an absolutely pure soap, into which has been incorporated the antiseptic properties of the Pine Forests with the Disinfecting Virtue of Coal Tar.

FOR ALL CLEANSING PURPOSES, INCLUDING THE BATH AND TOILET

PACKED THREE TABLETS IN A CARTON.

EDWARD COOK & CO., LTD., BOW, LONDON, E. 3.

VOL XLIII.—No. 5. Issued February, 1923.

JOURNAL OF THE ROYAL SANITARY INSTITUTE.

Telephone : VICTORIA 3739.

Telegraph : "SANITUTE, CHURTON LONDON."

Contents.

Congress at Bournemouth—

CONFERENCE I.—Representatives of Sanitary Authorities.

Opening Remarks by the Lord Mayor of London 209

Address by Alderman J. E. Beale, J.P. 211

"The Conservation and Allocation of National Water Resources," by Percy Griffith, M.Inst.C.E., F.G.S. 218

"Unemployment and Public Health," by R. J. Ewart, M.D., D.Sc. 225

"The Milk Supply," by S. G. Moore, M.D., D.P.H. 231

"The Problem of Dental Disease from the Point of View of the Health Authority," by F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S.Eng. 236

"Difficulties arising out of the Change of Policy in Housing," by Edmund R. Abbott... 241

CONFERENCE II.—Medical Officers of Health.

Address by W. J. Howarth, C.B.E., M.D., D.P.H. 244

"Is the Best Use being made of Fever Hospitals?" by W. Allen Daley, M.D., B.A., B.Sc., D.P.H. 249

"Propaganda Work for the Education of the People in Health," by James Wheatley, M.D., D.P.H. 251

"Are Venereal Disease Clinics fulfilling their Functions?" by D. Morley Mathieson, M.A., M.D. (Edin.), D.P.H. 253

"Are the present Methods of Disinfection worth while?" by T. W. Naylor Barlow, O.B.E., M.R.C.S., D.P.H. 258

CONFERENCE III.—Engineers and Surveyors.

Address by Norman Scorgie, M.Inst.C.E. 261

"Seaside Health Resorts," by F. P. Dolamore, F.S.I. 264

"The Hygiene of an Inland Health Resort," by C. E. Rivers, A.M.Inst.C.E. 267

"Some Aspects of the Work of a Municipal Engineer in a Health and Pleasure Resort," by Harry W. Smith, A.M.I.C.E. 271

"Refuse Disposal and Salvage Methods for Small Towns," by J. W. Hipwood, A.M.Inst.C.E. 275

Supplement—

Reviews of Books *85*

Meetings Held *89*

General Notes *89*

Forthcoming Meetings *90*

Obituary *91*

Calendar *92*

Elections *95*

LIST OF ADVERTISERS.

The numeral indicates the page on which the Advertisement appears: the dash (——)denotes that Advertisement is not in this issue.

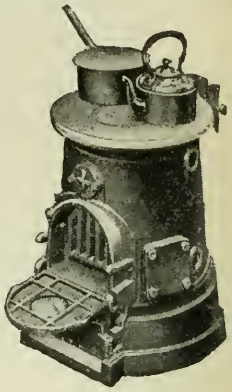
Activated Sludge, Ltd. xii
Bayliss, Jones & Bayliss, Ltd. ... —
Berkefeld Filter Co. (British) ... iv
British Commercial Gas Assn.... —
British Electrical Development Assn. —
British, Foreign & Colonial Automatic Light Controlling Co., Ltd. xiii
Broad & Co., Ltd. vi
Burn Bros. (London) Ltd. ... vii
Cadbury Bros., Ltd. ... ... —
Candy Filter Co., Ltd. vi
Claughton Bros., Ltd. ... ... —
Cook, Edward, & Co., Ltd. ... i
Crapper, Thomas & Co., Ltd. ... viii
Dominion Machinery Co., Ltd. —
Doulton & Co., Ltd. v
Educational Supply Assn., Ltd. —
Ferodo, Ltd. ix
Flavel, Sidney, & Co., Ltd. ... —
"Glaxo" ... ... —
Harley, T. ix
Harpic Co. ... ... —
Harrison, G. W., & Co. ... —
Holts Patents, Ltd. ix
Horlick's Malted Milk ... ... —
Horton Manufacturing Co., Ltd. iv
Jennings, George xi
Jennings, George, Ltd. ... —
Kay Bros., Ltd. ... ... —
Kirby, Fairbank, Ltd. i
Lewis, H. K., & Co., Ltd. ... —
Macfarlane, Walter, & Co. ... —
Manlove, Alliott & Co., Ltd. ... x
Meldrums, Ltd. ... ... —
Minimax, Ltd. iii
Newton, Chambers & Co., Ltd. vii
O. Bruster & De Launoit ... iii
Pontifex, H., & Sons, Ltd. ... —
"Ronuk," Ltd. ... ... —
Royal Society for the Prevention of Cruelty to Animals ... —
Sankey, J. H., & Son, Ltd. ... —
Septic Tank Co., Ltd. ... ... —
Sharp, Jones & Co., Ltd. ... xi
Silicate Paint Co. iv
Slack & Brownlow ... ... —
Smethurst, Herbert, & Sons, Ltd. —
Tintometer, Ltd. ... ... —
United Alkali Co., Ltd.... ... viii

Particulars of the Arrangements for Advertising in the Journal can be obtained from the Offices of the Institute.

The Boiler that can be relied upon to do its work is The "GLOW-WORM."

The **ORIGINAL** Boiler of this Design and the **only one** with efficient Hot Plate on which you can **really** boil and cook.

1. **Maximum Efficiency.**
2. **Minimum Consumption of Fuel.**
3. **Low Cost.**



Size No. 1. Raising 42 gallons 100° per hour listed at **£12 10s. 0d.**

Size No. 2. Raising 56 gallons 100° per hour listed at **£14 10s. 0d.**

Made with **Shaking Bottom** for use with Coal, Coke or Anthracite, and **will consume Household Refuse.**

Size No. 1 provides for—

Abundant Hot Water Day and Night.
A Hot Bath every 15 Minutes.
A small Radiator System, Towel Rail, etc.
Warms the Kitchen.
Simple Cooking Operations.
A Fire always visible.
An open Fire for toasting and heating irons.

ALL AT A COST OF FROM 6d. TO 1/- PER DAY.

Can be connected to existing Hot Water Installation.

Sole Manufacturers (British make. Registere Design)

O. BRUSTER & DE LAUNOIT, 4, LLOYD'S AVENUE, LONDON, E.C. 3.

MAKERS OF THE FAMOUS "BASECO" PATENT BOILER.

FIRES

GIVE NO WARNING!

Preparation NOW is the only safeguard.

"MINIMAX"

CHEMICAL HAND

Fire Extinguisher

has proved its efficiency and reliability on over 57,000 occasions of actual outbreaks of Fire,

Every appliance is tested to withstand a much higher pressure than that generated by the chemical action set up. Also, each appliance is made of the best sheet steel lined internally and covered externally with lead, to prevent corrosion.

Full particulars from:—**MINIMAX Ltd. (Box 151)**

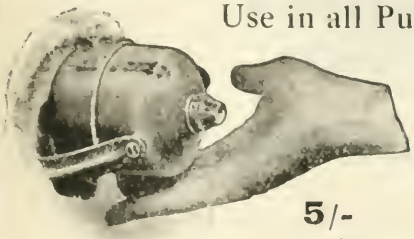
Head Office & Works:—**FELTHAM, MIDDLESEX.**

Branches:—**London, Glasgow, Dublin, Calcutta, Bombay, Sydney, Cape Town, Johannesburg.**

("MINIMAX" REGD. TRADE MARK.)

HORTON LIQUID SOAP

prevents the Possibility of Infection.



Use in all Public Lavatories for

Economy (50% saving over tablet soap).

Efficiency (Patented, locked, all metal, unbreakable, fool-proof containers).

Hygiene (each user gets fresh soap).

5/- each.

1,000 Rations for 1/-.

FROM **17/6**

PREVENTS WASTE, PILFERING, INFECTION.

HORTON JELLY CLEANSER, an odourless, non-lathering disinfectant Soft Soap for use with a mop (can be carbolised if required).
Unrivalled for the rapid cleansing of floors, paintwork, tiles, linoleums, etc.
50 per cent. Economy 100 per cent. Efficiency.

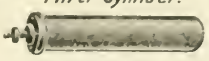
HORTON MANUFACTURING CO., Ltd., Rickmansworth, HERTS.

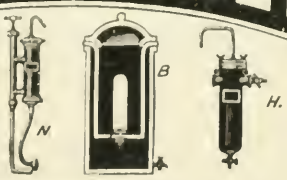
BRITISH OWNED

SARDINIA HOUSE, KINGSWAY, LONDON, W.C.2

THE BRITISH

BERKEFELD FILTER





H. H. BROWNLOW.
R. S. BROWNLOW.

"DURESCO"

WASHABLE WATER PAINT.

Sole Manufacturers:

THE SILICATE PAINT Co., Ltd., Charlton, London, S.E.

BY·APPOINTMENT·TO·HIS·MAJESTY·THE·KING

Doulton

SANITARY EQUIPMENT

SPECIALISTS

in the Design and Manufacture of

MODERN SANITARY EQUIPMENT

Suitable for

Palaces, Mansions, Hotels, Hospitals, Public Buildings. Clubs, Cottages & Housing Schemes, etc.

Competitive Estimates and Designs for all Classes of Sanitary Appliances will be willingly forwarded on application.

SHOWROOMS AT
LONDON, MANCHESTER,
LIVERPOOL & GLASGOW.

By special appointment
Doulton
Lambeth London

Telegrams:
DOULTON, LONDON.

Telephone:
VICTORIA 2260.

Volume XLIII. No. 5. Issued February, 1923.

JOURNAL

OF

THE ROYAL SANITARY INSTITUTE

CONGRESS AT BOURNEMOUTH.

CONFERENCE I.—REPRESENTATIVES OF SANITARY AUTHORITIES.

Opening Remarks, by the RIGHT HON. LORD MAYOR OF LONDON (SIR JOHN JAMES BADDELEY).

I DESIRE to express my pleasure at being able to attend this important conference. I think I am right in saying that this is the first occasion that a Lord Mayor of London has been present at one of the numerous provincial Congresses of the Royal Sanitary Institute.

We, in the City of London, are proud to be regarded as the Mother of Municipalities, and we are greatly interested in observing and sharing in the development of the work of local administration.

The duties which now devolve on local authorities are so numerous, and of so varied a character that Conferences are necessary, if only to ensure some measure of uniformity of action.

By their means, defects in our system are brought to light which require to be remedied, either by alterations in existing laws or by the provision of new statutory powers.

The days in which we now live present greater difficulties than any within the memory of those present to-day. So much requires to be done and so little money is available for the purpose. It is the duty of all to economise, but in effecting economies we must not lose the true sense of proportion. Ill-devised schemes of economy for reducing public health expenditure may easily result in wide-spread ill-health. A vicious circle may thus be created, since ill-heath would sure to be followed by reduced national earning capacity, and this again would further affect national stamina.

It is good health which makes life worth living for every member of the community. To the poor man it means less expenditure on special necessaries and less interruption to the inflow of wages. To the rich it means, at least, less domestic anxiety, and a greater capacity for extracting the best out of life.

Good health can be purchased by wise administration, but this need not necessarily be costly. Wise administration is the outward expression of intelligent effort on the part of the local authority, and such efforts are certain to be followed by equally intelligent personal effort on the part of individual members of the community.

The fact that results are not always immediately obvious makes it essential that far seeing, broad-minded men should constitute the personnel of Committees entrusted with the duty of health administration. No difficulty ought to be experienced in getting men to come forward to undertake the task.

I will conclude by expressing the hope that such men will not shirk their responsibilities, but will unhesitatingly share the burden of the work. It ought to be the pride of every community that the best men rule, whether they be representative of labour or of that class possessed of a bountiful supply of this world's wealth.

CONFERENCE I.—REPRESENTATIVES OF SANITARY AUTHORITIES.

Presidential Address by Alderman J. E. Beale, J.P., Chairman of Health Committee, Bournemouth.

General Considerations.

BOURNEMOUTH is a county borough blest by the bounteous hand of Nature, and whose existence from its earliest days has depended upon its health conditions and administration.

As Chairman of the Health Committee, I extend to you a very hearty greeting. I hope that by meeting together to discuss questions which vitally affect our people's health, we may encourage each other to put into practice those high ideals which, as administrators, we must possess, if we appreciate the responsibility of our important positions as public representatives. At no time in our nation's history have Local Authorities been confronted with so many financial and grave responsibilities as at the present day; nor at any period has the Ministry of Health asked us to carry out so many varied and onerous duties as now.

I assume the primary object of your visit to Bournemouth is to ascertain how you may improve the environment and the health conditions of your several districts. I know of no town favoured with so many natural endowments, which have been taken advantage of and adapted by the early Boards of Commissioners and later by the Mayors and Corporation and I trust that your brief sojourn here may give you inspiration and encouragement in your efforts to make your towns beautiful and healthy, so far as lies in your power. Health and Beauty is Bournemouth's motto, and as colleagues and co-workers in attempting to secure the benefit of those two endowments, I shall venture to address you on a few of the present day problems, as they occur to me after some sixteen years' experience as Chairman of the Health Committee in this County Borough.

There is one fact which stands out very clearly in my experience and that is the paramount necessity of educating the people to the importance of making the best of their surroundings. It is evident every day that some people, although they may have favourable environment, simply mar these conditions by their negligent and unclean habits, and one of the most serious problems is to teach the simple laws of health, so that the wanton and ignorant may know how to live to secure the boon of good health which they may do by the exercise of personal and household cleanliness, notwithstanding their difficulties in obtaining a separate house for each family. As public

representatives, we may insist upon the provision of large open spaces and parks, on the removal of slums, and provide for clean and wholesome streets, sanitary dwelling-houses and unadulterated food supplies, but unless the individual ratepayer will do his part, by exercising the first principles of " wash and be clean," our efforts will not avail much.

Even in this town, where the original dwellings of the working classes may be categoried as ideal, the problem of dirty tenants is by no means unknown, and they are, in their domestic negligence, a disgrace to themselves as well as to their neighbourhood. I consider the first essential of our communal activity is to secure that the unit house shall be satisfactory, and for this reason I place great reliance on the frequent and periodical inspections by the Health Officers in those districts where the population is massed together, and where unfortunate poverty prevails. These frequent and periodical inspections by the Officials of our Health Departments, and the removal of insanitary conditions has in the past been our first line of defence in preventing the spread of disease, amd in the maintenance of a cleaner standard of living among the indifferent and careless class of tenant and landlord, which one finds in all communities. So much for the individual responsibility of the householder.

I will now refer to a few of the difficulties, which, on the face, may only appear to be of a minor character, but which, nevertheless, have a direct bearing on the conditions of town life.

An important question which I think we, as public representatives, should consider is : the provision of facilities by which the adults and children in our thickly populated towns can secure the means of personal cleanliness. This is no new idea, for if we refer to some of the older religions, such as that of the Jews, the Assyrians and Egyptians, we find that frequent ablutions were imperative, and considered as part of their religious observances.

Personal cleanliness may be regarded as essential from a moral and physical point of view, and it should form a part of the national education of the children. Children are being taught the importance of light and fresh air, and it is equally important that the claims of a clean skin should be voiced also. By training, they should be encouraged in cleanly habits. Very few of the working-class parents realise that the special functions of the skin are as important as those of the lungs, kidneys and the heart. So far as I can learn, spray baths have found most favour among the nations on the continent. They appear to be the best and cheapest way for dealing with school children, and special schools could be provided with an installation for dealing with special districts. A warm spray bath is first applied, the chest is then soaped down, and the bathing finishes with a moderately cold douche. The cleansing is thorough, the dirty water is rinsed away, each child has

fresh water supplied, the danger of infection is lessened, the stimulating effect of the washing is greater, and the saving of time is an advantage. It is estimated that a school of 1,000 children can be washed once a week by the installation of 50 sprays, and the loss of school time to each child would be about 15 minutes. There would, of course, be almost innumerable difficulties in the installation of spray baths in many of our older schools, but the least we can do is to see that all new schools should be so provided, and to add to the schools for the older children, if no other means are available, by building separate premises to serve as bath centres. On the continent, before the war, Austria, Switzerland, Norway, Sweden, Belgium and, in advance of these, Germany made much progress in spray baths for children, and a great deal was done to teach bodily cleanliness on a large comprehensive system. We in England have come to regard, to a great extent, the swimming bath as a cleansing bath, whereas the real object of the swimming bath should be for physical exercise only. As we are aware, all sorts of ingenious contrivances have been adopted for getting rid of the objectionable scum and deposit in our public swimming baths, which might be avoided by insisting that every bather should first be thoroughly washed and douched before entering the swimming bath.

It is, I think, generally admitted that the higher and middle classes of our nation are the best washed in Europe, and I hope the day is near when we shall be able to say the same of our working class population, the majority of whom at present have neither the opportunities afforded them in their homes nor in public premises.

The Question of Roads and Road Traffic.

The substitution of motor cars, motor lorries, steam and electric tractors in place of the horse vehicle has necessitated a general improvement in the construction and the maintenance of the road surface. Tar-Macadam and the tar-spraying of roads have superseded the ordinary macadamized road, and the road surfaces are more easily cleansed and scavenged. But the drawback of the clouds of fine dust which are thrown up by the rapid automobile traffic, and which permeate our shop premises and articles exposed for sale, is a serious one, and is very difficult to prevent. In our Borough, owing to the undulating formation of the roads, the soft creosoted wood paving has been generally adopted in the main thoroughfares. These roads are no doubt more absorbent than asphalted ones, and not being so hard and smooth may be more conducive to accumulation of dirt and smell in dry weather. By systematic and regular scavenging, these drawbacks have not been found really serious. When we consider the constituent parts of road detritus, the excreta of animals, particularly horses and dogs, mineral refuse and droppings from all kinds of conveyances, expectoration

and spitting, and other kinds of refuse too numerous to mention, together forming a contaminating conglomeration—it seems clear that the menace to health by the fouling of surfaces can only be reduced by systematic scavenging and watering.

Apart from the menace to health, there arises the enormous damage to goods and materials exposed for sale in shop windows and stores, particularly those abutting on the principal thoroughfares of our large towns and cities. I am afraid we public representatives do not fully realize the two sides of this question, and do but consider the cost of the scavenging and watering when we are preparing our estimates.

The number of dogs in our large towns is not always realized, and there is no reason why the fouling of our streets should be permitted, particularly by animals taken about on the lead : the principal offenders.

The Chamber of Trade for Bournemouth have realized the difficulties and dangers of dealing with street detritus, and have on several occasions petitioned the Health Committee to regulate the Street Trading dealing with articles of food purchased from street stalls and barrows.

The Health Committee are naturally in agreement with the opinions expressed by the Chamber, but unfortunately there appears to be no real preventive powers to deal with the question. When we realize what street dust comprises, viz. : grit, animal and vegetable refuse, bits of straw, dried manure from horses and other animals, dried sputum, moulds, etc., we cannot but wonder why outbreaks of ptomaine poisoning are not more frequent. Also the conditions are by no means ideal under which meat, bread, confectionery and dairy produce are exposed to street dust, particularly during the time of delivery from the tradesman's premises to the householder without any or little precautionary means to prevent contamination by dust, etc. Apart from the question of health, it seems to me that it would be an economic precaution on the part of the tradesman to prevent dirt, containing micro-organisms, moulds and yeast, from gaining access to the foods mentioned. There can be no doubt that with food kept in suitably warm and moist positions and exposed to such dirt, contamination, fermentation and putrefactive change does take place, which destroys the keeping properties, and it sooner becomes unwholesome and unmarketable.

With its Sanitary Code of Regulations which provide that perishable food supplies shall not be kept, sold, or offered for sale, or displayed outside any premises unless such articles are protected from dust, dirt, flies and other contamination, New York is much in advance of English legislation in the question of reasonable precautions being taken to secure cleanliness of food supplies. It is to be hoped that in the near future, good and practical propaganda work will be initiated to educate our people to the importance of

clean and wholesome food, not only milk, which is perhaps of the very first importance, but all perishable articles, subject to early putrefaction and decomposition.

The Medical Officer of Health has now to report on cases of food poisoning occurring within his district, and the suggestion that medical men should notify cases of suspected food poisoning is an excellent one, and will enable a complete investigation to be made in mild and sporadic cases, and will tend to check summer outbreaks of sickness. Many such outbreaks in the past have, no doubt, been due to food poisoning, and by means of bacteriological and scientific precautions, it is now possible to guard against such outbreaks and to investigate them more closely.

Clean Milk Supplies.

I have previously stated that to secure clean milk for the people is one of the most important of our duties. The Act of 1915, which has been in abeyance owing to financial considerations, is to come into force this year. The Bill introduced later to amend this Act, with the intention of enforcing clean milk to be supplied, has up to the present been shelved, but Sir Alfred Mond informed the House recently of his intention to bring it forward again.

Those Local Authorities who are desirous of still further reducing infant mortality, and are anxious to support a campaign of "Drink more Milk" in the interests of improving the general health of the community, are naturally disappointed that so little progress has been made.

A simpler Bill than that of 1915 is required.

The Act is supposed to be worked in conjunction with a general Tuberculosis Order, but at present there is no such general order in force.

Then there are to be appointments by the County Councils of veterinary and administrative staffs for the inspection of all cowsheds in rural areas, necessitating a charge on the rates which County Councils and rural areas are at present unable to bear.

To my mind, the danger of contamination to our milk supplies is due far more to human and domestic sources and the imperfect methods of distribution rather than to the processes connected with its production. The most careful production may be nullified without adequate protection in the final stages of distribution to the consumer. Clean production is, of course, desirable, and the two following points are essential: that the milk shall have a reasonably low standard of bacterial count, and that no milk shall be used from a cow affected with visible tubercular disease of the udder. These two points should be insisted upon with regard to the farmers, and the standard of cleanliness should be left to the distributor, who would be responsible for the milk supply to the consumer. I am of opinion that he, for his own protection, would see that the milk supplied by the producer

was up to the sample in order to avoid prosecution. Regulations could be so framed by the Ministry and made operative by the existing Public Health services without any serious increase of staff or expenditure. By all means encourage Grade A Certified Milk sales for delicate children and adults, who would be prepared to pay the higher charges under such circumstances, but I fear it is a mistake to introduce too many grades, and all such misleading terms as " Invalid Milk," " Nursery Milk," " Pure Milk," etc., should not be permitted.

The evidence from America, covering a period of thirty years, proves conclusively that pasteurization of milk for all practical purposes is a most efficient safeguard : it prevents waste and there is every encouragement provided for the producer to produce more milk : the supply becomes cheaper, more milk is consumed by the general public to the advantage of all, and beneficial results have followed by the epidemics averted and the lives improved or saved.

Louis Pasteur, who has been termed the Father of Preventive Medicine, and one of the greatest Frenchmen who ever lived, found that prolonged heating at a low temperature will destroy the microbe effectively, and that milk thus treated is safe, and is not spoilt for any purpose, nor does it in any way affect the digestibility. The prevention of pasteurized milk not souring so rapidly in hot weather is also an economic factor. Dr. J. M. Hamill's report also removes any doubt as to the supply of pasteurized milk for infants, providing small quantities of orange juice are occasionally administered, and he advocates safety as being the most important factor in infant feeding.

Venereal Disease.

There is another branch of cleanliness, which I feel it is incumbent to mention, although the subject is one which it is not pleasant to refer to. I mean the spread of Venereal Disease, which during the war and since has much increased in our civil populations.

In nearly all our large centres of population it has been found necessary to arrange for venereal clinics, and the attendances at most have shown their special need.

Now we know the insidious nature of the disease, and the terrible results of the secondary and advanced symptoms, it surely is time for we public representatives to set aside stupid prudery and to use every means and endeavour to instruct and advise our people on the dangers of sexual irregularities.

By all means advocate moral preventives, such as marital fidelity and chastity, which after all are the most infallible preventives, but if these fail, and there appears to be convincing evidence that the present prevailing prejudices against the ecclesiastical authorities and moral discipline have

resulted in the increase of vicious habits and ideas, the question arises—must we fall back on our second line of defence, and advocate the adoption of the methods of personal disinfection.

It does appear to me to be somewhat illogical to recommend the introduction of early treatment centres where persons can go after exposure, and at the same time not to publicly recommend self-disinfection, where the interval of delay would be shorter and perhaps save the long and tedious treatment, which treatment we find many patients will not persevere in, but set aside before an absolute cure is pronounced. The Ministry have publicly stated that a thorough cleansing of the body after infection will tend to reduce the likelihood of the disease. Sufficient medical evidence has been given to the general public to show that the spread of venereal disease can be checked by immediate self-disinfection. It is to be hoped that the recently proposed Committee of Enquiry will definitely decide these important questions, and will thus be able to give a lead to lay-members having the responsibility of practical administration.

Conclusion.

I am such a fervent believer in the gospel of cleanliness, that this must be my reason for dwelling at such length upon the subject, and I am convinced that in the interests of our teeming populations, we must endeavour to inculcate the principles of cleanliness as the opportunities arise in our civic capacities, in our home life and our personal avocations, if we wish to develop those finer senses which depend almost entirely on pure air, clean water, light and food.

I was reading a short time since how the Americans have realized the importance of frequent bathing, healthy physical exercises, massage treatment and clean environment when dealing with their criminal class, and it is claimed that, by so doing, they stimulate mental and moral improvement. By this gradual and subtle process, they lead a character, addicted to coarse and vicious tendencies, to form clean and more wholesome thoughts and actions.

Physical and moral cleanliness can be more effectually taught by the outward examples of clean towns, clean homes and environment, and clean living in all our civic and private capacities, and as representatives of the public authorities, we should particularly endeavour to induce and maintain the highest ideals of cleanliness in its broadest meaning.

The Conservation and Allocation of National Water Resources, by PERCY GRIFFITH, M.Inst.C.E., F.G.S. (Fellow).

INTRODUCTORY.

WATER supply, in its most general application, presents certain peculiar features which are worthy of remark before we proceed to discuss the immediate subject of this paper. Foremost among these is the apparent paradox that, on a matter so vital to the health and comfort of any community, public interest is so conspicuously lacking. The author, being by profession a water engineer, has some diffidence in suggesting that the reason for this lies in the fact that, in this country the public water supplies are so efficient that the difficulties in securing this result are never realised by the public. Nevertheless this will, he believes, be accepted as a statement of fact, and it is only necessary to point out that the credit for efficiency is due, not so much to the small number of consulting engineers, as to the larger number of permanent officials by whom the water undertakings are maintained in the efficient condition which is accepted by the public as a matter of course, and therefore as a fact of little interest.

Some few years before the war, the author, in his then capacity of Secretary to the Institution of Water Engineers, had his attention drawn to the national control of water-supplies in Germany, and observed, with some envy, that, in that country, the question had been dealt with on lines constantly recommended, but never carried out, in this country. There, the question of private interests in water sources is subordinate to that of the national interests, subject only to communal interests, and the whole of the national water-supplies are reserved to the Government so far as national necessities may require. At present the author confesses to a broader view of the problem, and to having lost his primary sense of envy in regard to German methods; nevertheless it is, perhaps for that reason, not inappropriate to draw attention to the disadvantages attaching to British ideas of individual freedom as affecting interests of the community in regard to water supply.

As a matter of fact, the present interests of the community are affected to a greater extent than is generally realised; firstly, as regards the expense involved in promoting large schemes, whether required for large cities or for large rural areas; and secondly, as regards the economical utilisation of the available sources for the varied interests concerned, including the provision of water power, the maintenance of inland waterways, and large industrial purposes not supplied from public works. During the war many special difficulties arose in providing water for military centres, and for populations

temporarily increased in consequence of military activities. So far as public attention is concerned, both the difficulties arising out of the war, and those inherent in our normal conditions were, and remain, unapparent for identical reasons; firstly, because the engineering problems were, and are, solved by the skill of our engineers, and secondly, because none but the experts involved in solving those problems are aware of the fact that the expenses might have been, and might be, reduced.

This Institute stands in an unique position in relation to the question on account of the very wide communal interests it represents. It is, of course, needless for a water engineer to impress upon sanitarians the vital importance of public water-supplies. He can only express regret that the very efficiency of the services he represents should have served to obscure the importance of the industry in which he is engaged, and thus to leave the Legislature without that spur to activity which, in this democratic country, is the essential preliminary to useful domestic legislation. This Institute joined with a number of kindred institutions equally interested in questions of public health, in a deputation to the President of the Local Government Board, as far back as the year 1902, when the following points were urged as requiring legislative action:—

(1) The present system of control over undertakings for public water-supply is unsatisfactory. (2) The existing powers for enforcing a proper water-supply are inadequate. (3) The areas allotted to existing local authorities are altogether independent of the sources of water-supply, and the trouble and expense of forming united districts and joint water-boards are unnecessarily great. (4) The law relating to underground water is inequitable, and a standing danger to many water supplies. (5) The law relating to the pollution of water requires revision. (6) The provisions for preventing waste are insufficient. (7) The collection and publication of official returns relating to existing undertakings is much to be desired.

These statements are, for the most part, as true to-day as they were 20 years ago, for during that time no water-supply legislation of national importance, except the abortive "Water-supplies Protection Bill" of 1910, has been promoted. If it is urged that the results in terms of the public health have justified the Parliamentary and public indifference now complained of, sanitarians and water engineers may claim the credit for having achieved the results in spite of needless legislative difficulty, although at needless public expense. We stand to-day, as we stood 20 years ago, prepared to face and overcome the difficulties, whatever they may be, but our claim to legislative assistance is now stronger than it was, because the demand is more insistent, and the question of economy, both of money and water, is far more serious than it has ever been.

The war has, however, secured a momentary interest on the part of the Government by forcing upon its attention a question of great importance and of popular interest, but subsidiary to that in which sanitarians and water engineers are concerned, namely, the utilisation of our national resources of water-power. At a time when our fuel resources were being strained to the utmost, and coal was a vital factor in securing the ultimate victory, the suggestion that the use of our water resources for power purposes would relieve the strain on our coal supplies to the extent of many millions of tons per annum, with the advantage of reducing the import of oil fuel, was welcomed with some enthusiasm. A Special Committee was appointed in June, 1918 (just prior to the termination of hostilities), charged with the duty of examining and reporting upon " the water-power resources of the United Kingdom, and the extent to which they can be made available for industrial purposes."

The earlier efforts of this Committee were devoted to certain definite schemes which were considered as likely to " be of service to the Board of Trade and the Ministry of Reconstruction in providing employment for labour," and an interim report was issued in February, 1919, dealing with these schemes, and with some other aspects of the question ; but the final Report seems to suggest that the value of this Report was not great, and its contents are not further referred to. On the contrary, the Committee " suggest that the present (Final) Report should be regarded as superseding entirely the First Interim Report." In June, 1919, the Institution of Water Engineers had the honour of entertaining the Chairman of the Committee, Sir John Snell, M.Inst.C.E., at their annual dinner, and in the course of his speech on that occasion he admitted that the Committee had arrived at the decision that, in regard to water resources, the interests of " water-supply for health and domestic purposes must certainly have precedence " over those of water-supply for power purposes, and he thought that the Committee was not properly constituted to deal with the question of water-supply as a whole. These views were evidently shared by the other members of the Committee and by the Government, for shortly afterwards five gentlemen particularly concerned in public water-supply (including the then President of the Institution of Water Engineers) were added to the Committee, and in October of that year (1919) " the terms of reference to the Committee were enlarged by the addition of the following instruction :—To consider what steps should be taken to ensure that the water resources of the country are properly conserved, and fully and sytematically utilised for all purposes."

The Final Report was issued in November, 1921, after two years' strenuous investigation of the many complex problems involved, and, as illustrating the accuracy of the remarks made in the earlier paragraphs of this paper,

it will be appropriate to record the attitude of the Government to this important question. In a reply to a question, the President of the Board of Trade, on March 13th, 1922, made the following statement:—"The Government do not see their way at present to introduce legislation dealing with the control of water-power developments or constituting a Water Commission, as proposed by the Water Power Resources Committee; but the Minister of Health has taken certain administrative measures, and is setting up an Inter-Departmental Committee, as recommended by the Committee, to co-ordinate the work of the several Departments responsible for the different water interests. The minor recommendations of the Committee cover a very wide field, and the manner in which it is proposed to deal with the various suggestions cannot easily be explained in an answer to a Parliamentary question."

Whether right or wrong, the conclusion appears inevitable that the extension of the reference from the popular subject of water-power development to include the more prosaic question of water-supplies for domestic use has deprived the subject of any popular interest, and thus led to the work of the Special Committee being wasted, or at the least, pigeon-holed for an indefinite period. Such being the present position of affairs, the author will devote the remainder of this paper to a cursory review of the main problems involved, and of the recommendations of the Special Committee in regard thereto, and to suggestions having for their purpose the effective utilisation of the Committee's work.

The Problems Involved.—These are, of course, too many and too complex to be discussed at length in this paper, but the author very confidently refers to items 3, 4, 5, 6 and 7 (quoted earlier in this paper), as representing the main defects in the existing conditions. To these must be added the question first referred to the Water Power Resources Committee (also quoted above), and the more immediate question of the legislative action involved in carrying out any improvement of the conditions now prevailing. As a water engineer, and even more confidently from his intimate acquaintance with a large proportion of the resident water engineers responsible for the various waterworks throughout the country, the author does not admit the existence of any difficulty of an engineering character which cannot be surmounted by the talent available. This is, indeed, proved by the fact that, even after a period of 8 years during which waterworks extensions have been practically in abeyance, domestic and ordinary trade supplies are, generally speaking, in an efficient condition; but even as regards water-power development, the author contends that the reasons for our present backwardness are economic rather than technical. Were hydro-electric development an economic proposition in this country, an abundance of

engineering talent would be quickly available, but until this is the case it seems worse than useless to artificially foster the specialization of engineering talent in this direction. If water-power development offers a reasonable prospect of commercial success this will follow naturally ; but if it is to the national advantage that it should be fostered regardless of its capacity to earn an adequate return on the capital required, the initiative rests with the Government, and lies in the direction of either guaranteed dividends, bounties, subsidies, or financial assistance of one kind or another.

Recommendations of the Water Power Resources Committee.—It is impossible to reproduce these in full in this paper, but for other reasons than the obvious limits of space it will be more easy, and also more appropriate, to call attention to the essential points upon which the Committee have failed to report rather than to reproduce their recommendations. Before doing this, however, it is necessary to make a brief reference to the Final Report as a whole. Among the many and voluminous reports on water-supply to be found in the library of a water engineer there is probably not one in which the problems of the day are so comprehensively stated as in the report we are discussing. Upon the question of water-power resources there is certainly nothing comparable to it. As a contribution to the literature of water resources this report is invaluable and unique. Unfortunately, however, while it states the problems, and plainly indicates the ideal conditions by which they *could be* solved, it fails to emphasise the fact that legislation is an essential preliminary to effective progress. More particularly does it fail in suggesting the exact nature of the legislation required. Take, for instance, the most important and valuable recommendation which the report contains ; that is, the formation of a Water Commission, to which all questions of allocation of sources should be referred, and consider the difficulties which would face the draughtsman called upon to frame the Parliamentary Bill necessary to give effect to it. The first question which must arise in such cases is the relation of the proposed Bill to existing enactments, and here the difficulty of establishing a new statutory body with the comprehensive functions ascribed to the proposed Water Commission at once becomes apparent. These functions, even as stated in the summary contained in paragraph 270 of the report, overlap functions at present performed by Parliament, Government Departments, Local Authorities, and a host of other bodies, including existing water authorities as such. It is obvious that such comprehensive functions could only be legalised by the repeal of a vast array of public and private Acts, or at least of parts thereof. In the execution of the duties allocated to the proposed Water Commission, there would, however, arise many minor points of overlapping and conflict, not less serious in their prejudicial effect on the ideal result in view.

Let us now consider the valuable suggestion as regards the collection and collation of hydrological data. This function the Committee consider to be so eminently desirable that all parties concerned would be ready to supply information on request, and no compulsive enactment would be necessary. The experience of this Institute, and of the Institution of Water Engineers points to an opposite conclusion; moreover, it seems obvious that unless the returns are required by statute they could never attain the completeness upon which their *value* would, in a large measure, depend. As regards the nature and form of the data required, the report contains most valuable suggestions, based not only on practice in Canada, where water-power constitutes such an important proportion of the natural resources, but also on detailed schemes prepared by eminent water engineers in this country. But it does not appear to have been recognised that by far the larger and more densely populated areas in England are dependent upon either more or less polluted rivers or underground sources, as to both of which there is a crying need for legislation, and the systematic collection of hydrological data. Upon neither of these thorny problems does the report make any specific proposals, yet the author's own experience shows that they constitute the most important and the most difficult of the problems involved in the conservation and allocation of our national water resources.

Practical Suggestions.—Realising that destructive criticism is both easy and of little value, the author will conclude by giving some suggestions conceived with due regard to the difficulties involved, the most urgent demands of the moment, and the value of the work accomplished by the Special Committee.

(1) It appears that the circumstances of the moment are such that voluntary efforts at improvement are useless; not because of any unwillingness on the part of the various parties concerned to undertake either the necessary trouble or expense, but simply because it is a co-ordination of effort and a fair distribution of the expense which is required, and this must be provided by the Government.

(2) This co-ordination of effort and equitable distribution of expense obviously require the establishment of a national organisation, such as is recommended by the Special Committee, and designated a Water Commission.

(3) The constitution of such an organisation necessarily involves legislation in the nature of a Public Bill, and as this must be promoted by the Government, it must obviously deal with broad principles of general application consistent with national, rather than sectional, interests.

(4) Legislation of this character inevitably involves the consolidation of the many (at least nine) General Acts bearing, wholly or partially, upon

waterworks construction and control, as well as the various matters of principle and precedent at present incorporated in the Model Water Bill. New legislation is also required to provide facilities (possibly of a financial character) for the development of water-power, and for the provision of public water-supplies by Rural District Councils (with or without assistance and control by County Councils), as well as to remedy many minor inconveniences inherent in our present waterworks law, including therein questions of rivers pollution, waste of water drawn from mine shafts, and the prevention of domestic waste or misuse of water. In regard to the last point, the standardisation or regulations and of water fittings is a matter which should be dealt with on national lines, and not, as now, left to the energy and enterprise of private organisations. Upon all these points the Institution of Water Engineers published in 1911* a report containing valuable suggestions worthy of serious consideration by the Government.

(5) The greatest difficulty of all is probably public indifference to a matter of national importance, yet one involving certain technical points which are repugnant to the communal enthusiast and to the non-technical Member of Parliament. The only suggestion the author can make on this point is that all the technical and municipal institutions concerned in this matter should combine, firstly, in defining the nature and scope of the legislation required; and secondly, in arousing interest throughout the country and in Parliament by publishing broadcast the advantages which such legislation would provide. Among all such bodies none could more justifiably and disinterestedly take the initiative than the Royal Sanitary Institute, whose only concern is the public welfare in terms of the public health.

* *Transactions*, Vol. XVI., p. 209.

Unemployment and Public Health, by R. J. Ewart, M.D., D.Sc., Medical Officer of Health, Barking.

To analyse the relation of employment and health, no better period could be chosen than the last decade. We have no records of any period showing such violent fluctuations. In 1918, the percentage unemployed (mainly skilled workers) was 8, in 1921 it had risen to 15·3, and yet the rates by which health is measured showed some improvement.

(The following points are taken from the review of employment and wages in 1921, from the Labour Gazette for January of the present year.) It is to be noted that the decline in employment began towards the end of 1920, and was soon followed by the disastrous coal strike (April to July, 1921) and by the end of the year the percentage of unemployed (Unemployment Insurance Act) reached 16.

The number of trade disputes was not abnormal (about 800), but 1,824,000 work-people were involved, leading to a loss of 86 million working days ; this is the highest on record, and is double that for 1912 (also a year of big coal strike). These figures do not include ancillary trades to those in which the dispute occurred.

With respect to wages, 1920 represents the high-water mark. The figures in the accompanying table show the steady rise which has occurred during the period under review. It is to be noted that the index numbers measure real wages, that is, the actual amount of goods, rent, etc., purchased and consumed by the worker in each year. The steady rise in the value of real wages has been almost continuous since 1860.

Again, it used to be thought that the industrial diseases were limited to certain specific occupations. Dr. Major Greenwood and others have shown that our staple occupations are carried on under conditions which necessarily take a certain toll of life, and that, given adequate sustenance, the operatives would live longer if they were engaged in other pursuits, or not occupied at all. Hence, in periods of bad employment, provided adequate relief is obtainable, the death rates in certain trades might reasonably be expected to fall (cotton, iron-workers, bootmakers, etc.).

The two factors concerned in unemployment, firstly, the rest from laborious toil under unfavourable conditions of life (comparable to holidays), and secondly, the deprivation that is voluntarily borne before appeal to the Guardians for assistance, are necessarily to some extent compensatory. It is not surprising therefore, that when the health returns are examined, after periods of trade depression or industrial strife, no definite trend is observed.

We can, however, conclude that there is a relationship between unemployment and health, but that it is masked by the great changes in the standard of life dependent on the figure measuring real wages.

Real wages is of necessity an economic consideration and must depend on trade and cost of production as measured by units of labour for units of output. It is to be regretted that up to the present no satisfactory physiological measure of the cost of production has been invented. Thus a ton of coal now comes to the surface by the expenditure of about 300 calories per man, 50 years ago it took 750, the balance being made up by machines of all kinds. This applies to most industries. Hence every man is, on the average, at least twice as rich as he was fifty years ago, and the major part of the improvement in the public health at the present time can be directly or indirectly traceable to this fact. If trade becomes bad, health and all associated with it necessarily suffer. The history of the last ten years, especially in Russia, has clearly exemplified this proposition. It is contended, on the other hand, that preventive medicine may have played its part in the industrial evolution of the last century, and that such could not and would not have occurred unless smallpox had been brought under control. "Could not" because of the social upheaval these epidemics caused, and "would not" because the deaths from smallpox are strongly selective, and as far as our evidence goes, suggests that mainly such children as would subsequently enjoy an enhanced intellectual development are removed It would be reasonable to expect that the leavening of the population by this group may have in some way accelerated industrial growth. Putting these points briefly, they may be set out as follows: Firstly, that food is still a very potent factor in health, and probably the variations during the last ten years are mainly dependent on it. Secondly, that in so far as unemployment tends to curtail the food supply, it also is detrimental, but, owing to the industrial conditions imposed upon the worker, the improvement in health consequent on a holiday counterbalances the effect of a deficient food supply. The deficiency is never absolute, and depends on the policy followed by the local guardians.

A word may be said on the centre stone of the arch upon which the whole structure rests, viz., the principles upon which parish relief is provided. The query may be again raised as to whether the time has arrived for the removal of the penal aspect of parish relief. If we say it has, then unemployment would in all probability vanish automatically, because every man must be fed and housed, and if he has no work it would be obviously cheaper to provide him with some than to give an adequate sum without demanding something in exchange. If we admit that the threat of starvation should be removed and that the penalty for failure in life's competition should be

reduced to denial of choice of occupation only, that is, that he does such kinds of work as are found for him, then a new state of affairs rises. (It is to be noted that, to all intents and purposes, this standard was in operation in 1920 and 1921.) As to whether there would still be a sufficient stimulus to effort is a matter on which there may be much difference of opinion. The effect of such a policy would be far reaching, both as regard public health and economic circumstance.

The factor, so far as the present discussion is concerned, is to what extent will a man deprive himself and his family of the necessities of life before he will submit to the conditions (admission to workhouse) imposed. These conditions are, of course, penal, and are meant to be so by the responsible authority.

As a via media the system of outdoor relief is extensively used. The guiding principle here is the rate of wages acceptable to the people working in the district. The variations are considerable, but the principle must always be operative. To take an example, supposing the average man with wife and three or four children is prepared to accept £3 a week for his labour. Then an unemployed man on the same family basis might receive a similar sum less 25 per cent. The sum is usually worked out on " pro ratio " basis, and is so adapted that a man and wife with five or six children dependent (it is very unusual to have more) will receive slightly less than the standard wage. Relief depends on the standard wage in the district. If the latter is inadequate, the former is a starvation pittance, and a deterioration in general health is a necessary consequence. Hence out-relief depends upon the value of real wages, and rises and falls with it. Thus the out-relief of to-day would be a very liberal wage to the labourer of fifty years ago. Hence our difficulty in assessing the immediate effect of unemployment.

The following table bearing on the points commented on gives the history for the last 70 years.

Many more figures might be quoted to exemplify the associations depicted in the table (page 228), but they would still leave some ambiguity as to the existence of any association between health and employment in the mind of the reader. Taking this sample as a fair one, the following deductions may be drawn :—

Firstly, that there is a very close association between real wages and health at all periods of life.

Secondly, that employment may also be associated, but its nature is not clear. It is probable that if real wages were made constant, then a more definite association between health and employment would become manifest.

Year.	Percentage Unemployed of certain Trade Unions	Index figure representing value of Real Wages.	General Death Rate per 1,000 population.	Phthisis Death Rate per 10,000 population.	Sex Ratio pre-natal Death Rate.	Infant Mortality.
1921 ...	15·3	101	12·1	4	1,051	83
1920 ...	2·4	103	12·4	9	1,052	80
1919 ...	2·4	103	13·7	10	1,060	89
1918 ...	0·8	86	17·1	13	1,048	97
1917 ...	0·7	86	13·5	12	1,044	96
1916 ...	0·4	76	13·4	12	1,049	99
1915 ...	1·1	86	14·8	11	1,040	110
1914 ...	3·3	100	13·7	10	1,035	110
1913 ...	2·1	100	13·5	10	1,038	108
1912 ...	3·2	98	13·0	11	1,040	105
1911 ...	3·0	100	14·2	11	1,039	130
1910 ...	4·7	100	13·2	11	1,040	105
1909 ...	7·7	98	14·3	11	1,040	109
1908 ...	7·8	100	14·5	12	1,036	120
1907 ...	3·7	98	14·2	12	1,039	118
1906 ...	3·0	97	15·3	12	1,041	118
1905 ...	5·0	96	15·2	12	1,036	132
1904 ...	6·0	97	16·2	12	1,037	128
1903 ...	4·7	99	15·4	12	1,035	145
1902 ...	4·0	99	16·2	12	1,039	132
1901 ...	3·3	97	16·9	12	1,040	133
1900 ...	2·5	96	18·2	13	1,039	151
1899 ...	2·0	95	17·4	13	1,032	154
1898 ...	2·8	96	17·3	13	1,037	163
1897 ...	3·3	96	16·9	13	1,036	160
1896 ...	3·3	94	18·5	13	1,034	156
1895 ...	5·8	92	16·4	14	1,036	148
1894 ...	6·9	90	18·9	14	1,038	161
1893 ...	7·5	90	18·8	15	1,035	137
1892 ...	6·3	90	20·0	16	1,038	159
1891 ...	3·5	89	19·3	17	1,033	148
1890 ...	2·1	88	17·9	16	1,038	149
1889 ...	2·1	86	17·7	16	1,033	151
1888 ...	4·9	85	18·6	16	1,039	144
1887 ...	7·6	83	18·6	16	1,038	136
1886 ...	10·2	81	19·0	17	1,038	145
1885 ...	9·3	78	18·0	18	1,040	138
1884 ...	8·1	75	19·0	18	1,041	147
1883 ...	2·6	74	19·0	19	1,035	137
1882 ...	2·3	74	18·8	19	1,038	141
1881 ...	3·5	74	18·2	19	1,039	130
1880 ...	5·5	74	19·5	19	1,036	153
1879 ...	11·4	73	19·9	21	1,036	135
1878 ...	6·8	73	20·5	21	1,042	152
1877 ...	4·7	74	19·4	21	1,036	136
1876 ...	3·7	74	19·9	21	1,038	146
1875 ...	2·4	72	21·6	22	1,043	158
1874 ...	1·7	70	20·1	21	1,037	151
1873 ...	1·2	68	20·0	22	1,039	149
1872 ...	0·9	66	20·2	23	1,041	150
1871 ...	1·6	64	21·4	23	1,035	158
1870 ...	3·8	63		24		
1869 ...	6·0	61		24		
1868 ...	6·8	62	21·2	23	1,041	157
1867 ...	6·3	63		25		
1866 ...	2·7	64		26		
1865 ...	1·8	62		25		
1864 ...	2·0	60		25		
1863 ...	4·7	58	21·4	25	1,043	151
1862 ...	6·1	56		25		
1861 ...	3·7	56		26		
1860 ...	1·9	60		26		
1859 ...	—	54		26		
1858 ...	—	54	20·7	26	1,046	152
1857 ...	—	52		26		
1856 ...	—	54		27		
1855 ...	—	55		28		
1854 ...	—	56		28		
1853 ...	—	55	21·7	30	1,046	156
1852 ...	—	55		28		
1851 ...	—	55		27		

There can be no question as to the undesirability of unemployment outside its effect on health. There may be some who look upon its incidence as a factor in producing cheap labour, but the number is not large. The following list of remedies that have been proposed for the relief of its incidence does suggest that there is and always has been a whole-hearted desire to solve the problem :—

They may be summarised as follows :—

Protection against foreign competition.
Fair trade.
Prevention of foreign immigration.
Provision of adequate food and lodging by the State and removal of the penal aspect of the Poor Law.
Nationalisation of the land.
Emigration of the young.
Decentralisation or " Back to the land," small holdings, etc.
Extension of trade unionism and collective bargaining.
Control of the use of machinery.
Control of ground rents.
Provision of work by the local authority or State. (Distress work, reclamation, road making, etc.)
State control of industry.
State Insurance (*a*) Against sickness, (*b*) Against unemployment.

It is obvious that a discussion of the above cannot be undertaken, as each heading constitutes a thesis by itself. (The discussion in the Report of the Commission of the Poor Law, 1908, deals with the subject in detail.) Three points may be briefly referred to. The ultimate reorganisation necessary to prevent unemployment does not concern us, but simply certain expedients calculated to relieve its incidence.

Collective Bargaining.

Can it be said that the bargaining between capital and labour is fair except in such circumstances where labour is organised ? The introduction of the ordinary principles of sport should solve this difficulty. In all games there should be, of course, some equality between the parties concerned, and also in the possibility of gain or loss on either side. The same principle should always apply to bargaining.

The necessity of combination between the workers is obviously imperative if this ideal is to be achieved. Every worker should belong to some form of organisation. It is curious to note that England enjoyed her greatest period of prosperity during the fourteenth century when the Workers' Guilds were at their height. Of course, the minimum standards of that day were in no way comparable with the present, but distribution was much

more equitable, and the population was contented. Such combinations help elasticity and rapid adjustments should conditions change.

It is to be remembered that human happiness and contentment is inconsistent with striking inequalities in distribution. Inequalities there must be, but they should be no greater than is necessary to stimulate effort, and not so great as to crush vitality.

Who is to decide when this point is reached? Obviously, nobody, but, given something like fairness in bargaining, the point will decide itself.

Insurance.

This naturally resolves itself into three heads :—

1. Anyone may be unable to work from personal causes—ill-health, accidents, etc—or lose time whilst changing from one employment to another. This should be a charge on the individual and should be compulsory.
2. Employment fluctuates and depends on the weather, season, or other factor outside human foresight. This should be a charge on the industry and be also compulsory.
3. National fluctuations, such as are occurring at present, or fluctuations dependent upon foreign exchanges and other causes of a world nature. These should be the charge of the State and be met accordingly.

Industrial insurance is afforded by contributions from workpeople and employer and covers 1 or 2.

No. 3 is still unsolved, and in this connection the promise of work by the State or local authority is suggested.

Relief Works.

Guiding principles for local relief work :—

The work to be done and the means of carrying it through should be thought out long before the onrush of depression.

The man taken on should be carefully selected and placed as much as possible under normal conditions. There should be none of the features of a labour test for poor relief.

Persons should not be given relief work if ordinarily they are capable of getting regular work.

Grading is desirable in the work itself.

The work should be continuous and not broken. It is better to reduce the hours per day than have alternate weeks of idleness and work.

The wage paid should be appreciably lower than that paid under ordinary circumstances.

The Milk Supply, by S. G. Moore, M.D., D.P.H., Medical Officer of Health, Huddersfield (Member).

THE present condition of the supply of milk in this country is indicated in the following statements and Resolutions which have been endorsed and adopted by several important Sanitary Authorities :—

"Having regard to the following facts, each of which is well known, and none of which is in dispute, namely :—

(1) That the present milk supply commonly contains cow dung ;

(2) That 1 in every 10 or 12 samples examined produces tuberculosis in susceptible animals when inoculated into them ;

(3) That epidemics of dangerous infectious diseases have been proved to be caused by milk ; and

(4) That year by year large numbers of infants die from diseases of the stomach and intestines, caused by unsound milk ;

Resolved—That this Council urge the local Member of Parliament to press the Minister of Health to take steps in the present Session of Parliament to put an end to this unjustifiable and dangerous state of affairs.

Further, having regard to the impracticability of obtaining within any reasonable period of time an adequate supply of pure raw milk at a price which the public can afford, he be urged to press the desirability of Pasteurisation being required for all milk sold to the public for human consumption except 'Grade A Certified' milk."

It falls to consider how far the Milk & Dairies (Consolidation) Act, 1915, as amended by the Milk & Dairies Amendment Bills at present before Parliament, meets the situation. It is necessary to consider the former because the latter does not repeal it, but merely postpones its operation until the 1st September, 1925.

The Act is contained on 20 quarto pages. Manifestly there is not an opportunity to-day to consider its provisions in detail, a summary will suffice :—

The first Section authorises the Local Government Board (now the Ministry of Health) to make general or special Orders as they think fit for 13 purposes. These include all the usual Regulations for byres, dairies, milkshops, milkstores, milk vessels, and so on, dealing with cleanliness, and protection from contamination, preventing adulteration, the addition of preservatives and colouring matter, and so forth, and also the important measure of authorising Local Sanitary Authorities themselves to make Regulations for any of these purposes, subject to conditions to be prescribed by the Minister. Orders made under this Section must be with the con-

currence of the Board of Agriculture and Fisheries, and of course must comply with the requirements of all Provisional Orders; they must be laid before each House of Parliament, and not come into operation within 40 days after the date of the Order, and they may be annulled on an address to His Majesty by either House of Parliament.

The procedure of to-day in respect of tuberculous milk is elaborated, and fresh provisions are introduced, apparently designed for the compensation and protection of dairymen and cowkeepers, but no provision is introduced for the branding or tagging of an animal suspected or proved to be yielding tuberculous milk, the sale of which, however, is prohibited under penalty, as also is the sale of milk from an animal suffering from inflammation of the udder, and certain diseases specified in the 2nd Schedule of the Act.

There are provisions as to the sale of milk in public places, of condensed, separated or skimmed milk, enabling samples to be taken, for the appointment of Veterinary Inspectors, penalties for obstructions, fixing penalties for offences, interpretation, and so forth.

A consideration of these provisions leads one to the opinion that they are generally designed to elaborate and tighten up the existing law, except Section 12, which specifically authorises a Sanitary Authority to establish and maintain Depots for the sale of milk specially prepared for the consumption of infants less than 2 years of age, at not less than cost price.

The Amending Bill, as well as postponing the 1915 Act, contains certain valuable powers. For example, a Sanitary Authority may refuse to register, or may remove from the register, persons and premises if it appears to the Authority to be necessary in the interests of the public health. This, of course, is subject to appeal.

Again, it authorises the Minister of Health to license the sale of milk under special designations, namely ' Certified,' ' Grade A,' ' Pasteurised,' or such other designation as may from time to time be prescribed by Order of the Minister. This is a very valuable provision, but it does not go far enough.

The rest of the Bill may be summarised as follows :—

It prohibits the addition of colouring matter to milk.

It prohibits the sale of tuberculous milk; but to enforce the prohibition it would be necessary to establish the fact that the person selling the milk knew that it was tuberculous.

The concurrence of the Minister of Agriculture & Fisheries in any Order made under the Bill is required.

Power is taken to make Regulations for the prevention of danger to health from the importation of milk for human consumption.

I must confess that I view these proposals with profound disappointment.

The Medical Officer of Health for New York, Doctor Royal Copeland, on the 7th of July gave me the following startling figures :—

In 1891 the Infant Mortality Figure in New York was 291.

Thirty years later it had fallen to 71.

He definitely committed himself to the statement that in his judgment—and surely he is competent to form an opinion—this reduction is almost entirely to be attributed to the Milk Ordinances in force in that city. In effect, these Ordinances require that all milk sold for human consumption shall be either Pasteurised or ' Grade A Certified ' milk (incidentally he used these words :—" That is why I take off my hat to Nathan Straus," (and he did remove his hat in a reverent manner). " It is owing to his labours that this splendid work has been done."

When one reflects upon the conditions in New York (except for London, the biggest city in the world) containing areas of intense congestion, 500,000 persons in one square mile, a polyglot population, immigrants from districts where the standard of living is notoriously insanitary, one wonders what the result would be if such wise laws could be brought into operation in this country.

Nor can I discover any sensible objection to these requirements. It is abundantly plain that an adequate supply of pure raw milk can by no possibility be obtained for the population of these Islands within a reasonable period. In the " Lancet " of the 15th July there is a list of producers of ' Grade A Certified ' milk, 31 in number. In addition, in 8 other instances arrangements for its production are being made, and in 7 other instances ' Grade A ' milk is produced. If one regards these supplies as safe—which is somewhat risky to do, and if one assumes, which is a liberal assumption, that each produces 100 gallons of milk per day, that would mean that at the present time there are 3,100 gallons of ' Grade A Certified ' and 700 gallons of ' Grade A ' milk available daily for the population of England and Wales.

But we may not lose sight of the fact that competent authorities, whose good faith and sincerity may not be questioned, affirm that even ' Grade A Certified ' milk ought to be Pasteurised, because cows may develop tuberculosis, and yield tuberculous milk in the interval between the application of the tuberculin tests, and also, there is always the risk that communicable disease of human origin may find its way into the milk and give rise to epidemics. Therefore, it is urged that even such milk ought to be Pasteurised. This may be a counsel of perfection, but more cogent, more forcible, more convincing reasons and justification for the advocacy of Pasteurisation are found in (a) the facts that Pasteurisation of the whole supply could be obtained within a very short period, say 2 years, and (b) the cost of ' Grade A Certified' milk is simply prohibitive. I have recently made personal enquiry and I found that the charge was 7d. per pint.

In London at the present time a large Dairy Company is conducting a profitable business in Pasteurised milk at ½d. per quart above the price charged by competitors who are selling the usual dirty dangerous product.

I understand that big milk factors are in favour of Pasteurisation, that the opposition comes from Agricultural interests. I would humbly venture to express the opinion that this opposition is misconceived and mistaken. I recently had a conversation with a gentleman who comes from a large Canadian city (I don't feel at liberty to mention his name in public), but he told me that he handles 32,000 gallons of milk per day, all Pasteurised, that he started in a very small way of business, and that he built up his present prosperity by, as he phrased it, " delivering the goods," namely, purchasing the best milk available, centrifuging, Pasteurising, cooling, bottling, refrigerating, and then advertising. What would be the result in this country if the medical profession generally, and Medical Officers of Health more particularly, were at liberty, in a wholehearted unrestrained manner, to advertise the advantage of milk as a beverage ? The gentleman I have referred to told me that in the Restaurants and Cafés of his city one saw the people " sitting round sipping milk, hot in winter, iced in summer," that they were not drinking tea, coffee or cocoa. In this country, as we know from the Astor report, the average consumption of milk per head per day is 0.23 of a pint, a pitiable allowance, and that among working-class families it is even less. My informant gave three times the amount as the average consumption where he comes from. How the farmers here would profit if anything like that quantity were consumed in this country ! That is why I consider the opposition to Pasteurisation on the part of the Agricultural interest to be such a big mistake. And how the physique of our people would benefit. Then our young men might present the appearance of the Canadian Contingents we saw coming over here during the Great War ; then with a safe supply, consumed in large quantities, our Infant Mortality Figure would be reduced more than it has been in the past few years ; then we should see fewer unsightly scars in the necks of our young people, fewer hunchbacks, fewer cripples, and there would be less—substantially less—infectious disease.

Pasteurisation is required by law in New York, Chicago, Cleveland, Washington, Rochester, Winnipeg and Toronto to my knowledge, and I am reliably informed that the same is true of all the principal cities and towns of the United States. Why can we not have it here ?

The Surgeon-General of the United States Public Health Service states :—

> " The overwhelming majority of sanitarians are agreed that Pasteurisation of milk is the most effective means of protecting the inhabitants of cities from the communicable diseases which may be transmitted by milk."

"Cases of scurvy have been attributed to this action. Fortunately there is a wealth of practical observation at hand which shows that this fear is a bugaboo. The great majority of infants fed on Pasteurised milk do not develop scurvy. Some infants fed on whole milk, and even mother's milk, do develop scurvy. Scurvy can readily be prevented by the addition of some substance as orange juice to the dietary, and this should be a routine procedure in the feeding of infants. It was at one time hoped that it might be possible to prevent the introduction of disease germs into milk by a system of rigid inspection of employees engaged in its handling all the way from the cow to the consumer. This has been found by long and sad experience to be a fallacious hope. There is no system of medical surveillance sufficiently searching to detect all cases of incipient diseases or of disease carriers among the handlers of milk, and if there were, it would so impede the production and distribution of milk and would be so expensive that the babies simply would not get sufficient or perhaps any milk."

Another Surgeon-General of the same Service says :—'

"I am of the opinion that Pasteurisation is now quite generally recognised as a process necessary for the treatment of milk which is not otherwise protected against infection. Theoretically, Pasteurisation should not be necessary; practically, it has become necessary owing to the unfavourable conditions surrounding the production of milk."

"There seems to be no doubt that the disadvantages arising from the heating of milk are more than compensated for by the resultant effectual prevention of much disease and even death which might otherwise occur, especially in infants during the Summer months."

The Commissioner of Health, State of New York says :—

"In my judgment Pasteurised milk is the only safe milk. Even certified milk is more likely to convey infectious disease than a properly Pasteurised milk."

Doctor M. J. Rosenau, Dean of the Medical School in Harvard University says :—

"I regard Pasteurisation as a sanitary safeguard, and that the benefits far outweigh the few minor objections that have been brought against it."

Doctor Harris of the New York City Health Department says :—

"We are facing a condition and not a theory. It is a fact that a certified milk cannot be obtained for all the children of any moderate sized community. Further, we know from sad experience, attested to by statistics gathered in every large city, that the infant mortality rate has been enormous wherever raw milk as commonly sold has been used. We have come to know that Pasteurisation is a lifesaving measure in so far as concerns infants and children who depend upon milk as their chief food. Everywhere the introduction of Pasteurisation has resulted in an almost immediate and most striking reduction in the infant mortality rate."

I cannot conclude without recognising and making tribute to the work of Nathan Straus. His life long labours consistently carried on against strong and even bitter opposition (once he was arrested in connection with his campaign) are now generally recognised. Men of letters, high Government officials, Presidents of the United States, and last, but by no means the least, the Press unite in applauding this, his lifelong work. In gratitude for the Balfour declaration relative to Palestine and out of his large humanity (he says " Suffering and disease know no distinctions of race ") he now desires to extend the advantages of Pasteurisation to this country. He has expended substantial sums of money to that end without idea of recompense. It would be more than a crime, it would be a huge blunder were we to shut our eyes to the immediate crying need for this simple, cheap, readily available means of making our milk supply safe.

The Problem of Dental Disease, from the Point of View of the Health Authority, by F. W. Broderick, M.R.C.S., L.R.C.P., L.D.S.Eng.

I DEAL with the subject from a Public Health standpoint, and confine my remarks to the question as it affects the adult portion of the population. The Dental Treatment of school children presents problems that differ in many ways from that of adults, but with these I do not deal.

My claim to special knowledge of this subject, both as regards the necessity of some organised effort being undertaken to overcome or palliate the bad effects of Oral Sepsis and the want of a sufficient masticatory apparatus, and also of the best method by which this may be accomplished, rests on experience gained during the war, when I was for three years a Command Dental Inspector, and not only had great opportunity of becoming cognizant of the appalling condition of the mouths of what was, presumably, the healthiest and most efficient part of the male population of these islands, but was definitely responsible for drawing up a scheme for undertaking their treatment, and I had control of that scheme, watching it in practice and nursing it for nearly three years.

The report of the Departmental Committee on the Dentists Act of 1878, published in 1919, goes very fully into the condition of the teeth of our adult population, and I cannot do better than quote from it. " The evidence before the Committee presents a picture of almost hopeless neglect ; . . . Having regard to the large amount of preventable sickness and chronic invalidity terminating, in many instances, in premature death which results from the effects of Oral Sepsis and decayed teeth, the Committee view the facts which have been brought to their notice with the gravest concern. They are of opinion that the state of affairs revealed should receive early

attention with a view to the improvement of the health of the nation and an increase in its industrial efficiency."

Further (Section 135) : " If it be accepted that it is the duty of the State to ensure, in the national interest, that its citizens shall be maintained in a state of good health and working efficiency, we have no hesitation in stating that adequate arrangements for keeping the teeth of the people in a sound condition are one of the essentials to this end."

Consequently there is no need to give statistics dealing with the state of the teeth of the people, or to notice the need for some organised effort being made to meet the condition proved to exist. Rather must I deal with the lines on which treatment should be undertaken.

These naturally fall in two directions—Preventive and Curative, and, as the former becomes more and more satisfactory, the latter will become less and less necessary. But I stress the point that, however successful the Committee of the Medical Research Council that are now considering, the question of the causation of Dental Caries, may be, and, if they should be fortunate enough to find first causes, however successful preventive measures may in the future become, the damage that the adult portion of this generation have already suffered will necessitate a very large amount of repair and replacement of teeth.

The question of the Prevention of Dental Caries and of that other Dental scourge, Pyorrhœa Alveolaris, is by no means simple. We, as a profession, are not so certain as were our predecessors that tooth-decay is simply a matter of an unsatisfactory diet, many of us now doubt very much that pudding and sweets sum up the whole problem, nor do we believe that the tooth-brush correctly and sufficiently used is the answer to the trouble.

In saying this, however, I do not imply that we discard altogether the theory that the destruction of Dental enamel is produced by organic acids formed by the fermentation of carbo-hydrate food material on and around the teeth, but there is much evidence to prove that this is not the whole truth of the matter. For example, we all eat carbo-hydrate food, there must be fermentation and acid formation in the mouths of all, yet we, some of us, have a few teeth left and we occasionally come across elderly people with perfect mouths. Again, we often see perfect teeth in the dirtiest mouths and caries in the cleanest. Teeth decay in a more or less definite order and often symmetrically at the same time, and this order has no definite relation to the ease with which food will lodge in the mouth.

Caries is a disease of certain periods of life, it is rampant in the young and round about puberty, negligible in middle life, and practically absent in the old ; pregnancy often will bring in a fresh period of susceptibility, yet the diet of the pregnant woman does not differ materially from that of her non-pregnant sister, and we have no reason to suppose that she neglects her teeth more during this period.

Certain diseases again are noticeably severe on the teeth, and these are primarily the diseases of the young, *e.g.*, the exanthematous fevers, whilst others, the sclerotic diseases generally, seem to have the opposite effect. Gout and rheumatism give hard sound yellow teeth.

Lastly, Caries and Pyorrhœa would seem to be antagonistic conditions, when the second develops the former ceases, in fact, we may go further and say that the type of patient immune to caries will probably develop pyorrhœa in later life. Thus if excessive carbohydrate, *e.g.*, sugar, is to be considered the sole cause of caries it would seem logical to suggest insufficient sugar is the cause of Pyorrhœa, which is absurd. From this it would seem certain that there is a question of immunity or susceptibility to Dental troubles, preparing the way, so to speak, for the food fermentation to destroy the teeth, that is, that there is a predisposing as well as an exciting cause, and that this predisposing cause is constitutional.

Now it seems highly improbable that the whole civilised community is going to change its dietary to save their teeth, even if this was necessary, which it probably is not ; or that in the present condition of civilised mankind, people can spend more time over mouth hygiene than the more cleanly of us do to-day, consequently the problem of Dental prophylaxis is comparable with that of tuberculosis prevention, and it is the predisposing rather than the exciting causes on which we must direct our attention. We cannot hope to destroy the tubercular bacillus entirely, therefore we tackle over-crowding and place our patients under the best hygienic surroundings in Sanatoria, and also we know that if the teeth are or can be made immune, exciting causes matter not at all, whereas if they are susceptible, the utmost care of patient or Dentist will hardly be sufficient to preserve them. Exactly where this immunity lies is doubtful, but there seems reason to believe that it is constitutional, that not only do bad teeth lead to bad health, but that the reverse is also true, and that bad health leads very directly to bad teeth. Mrs. Mellanby has shewn that lack of Vitamin A does very materially affect the formation of Dental Enamel, and Howe has produced what would appear to be very definite Caries in the teeth of guinea pigs by a Vitamin-free diet ; on the other hand, I have shewn that an upset balance of endocrine secretion affects the Dental enamel, through an alteration in the Calcium-utilising power of the body under these circumstances, and these two observations, lack of vitamin and endocrine in balance, become linked together by the work of McCarrison who has proved that the vitamins act as stimulators of the endocrine apparatus. Be this as it may, it seems very probable that the time is not far distant when this riddle will be solved, and the next great step in preventive medicine will have been taken.

Passing now to the second point, a method by which the condition of the teeth may be dealt with. In the report of the Departmental Committee referred to above the Commissioners said (Section 142) : " The provision of

an adequate dental service to meet the existing need is impossible at present, owing to the shortage of Dentists, but your Committee are strongly of opinion that, simultaneously with the enforcement of prohibition of unqualified practice, the nucleus of a public Dental service should be set up in populous areas for the treatment of Dental Disease." Now this report was followed last year by an Act of Parliament to enforce the prohibition of unqualified practice, taking on to the Dental Register somewhere about 10,000 unregistered practitioners, thus increasing the number of Dentists to somewhere about 15,000, so it would seem that, in the opinion of the signatories of this report, some start is now possible.

Let us, then, consider how such a service could best be inaugurated. Two methods suggest themselves. First, that by Panels of Dentists each working in their own Chambers and remunerated by work done. Second, a part time clinic with payment by time.

Both these methods have been tried, on smaller lines, in ways that make comparisons with what would be necessary more or less sound. All comparison, however, with medical practice would be unsatisfactory owing, firstly, to the necessary time that conservative or reparative Dentistry takes as compared with medical examination, and secondly, to the question of the technical nature and expense of the manufacture of artificial Dentures.

At the beginning of the war, the War Office Authorities made arrangements for the necessary Dentistry for recruits to be undertaken by private practitioners at a special scale of fees, and an enormous amount of work was done on these lines. Later, however, this system was gradually superseded by the Army appointing whole time Dental Officers to take over this work, on account of the expense, loss of time and, in some cases, very unsatisfactory work done by the panel, that is, they found a clinic system preferable to that of a panel. This matter, however, was complicated by the question of the manufacture and supply of Artificial Dentures; whereas the individual practitioner had his own workshop handy, to fit these up for Camp Clinics would have been a big expense, and would have led to many difficulties in a training Army. To overcome this difficulty, very large Central Workshops were instituted to undertake the denture work for a series of Clinics, and this was found to work excellently in every way; further it was found that the more clinics were served by the workshop the cheaper and larger became the output of Dentures, the law of averages coming in, there were no "slack times," adequate and very expert supervision could be given, and the quality of the finished article improved.

In substituting for the panel, the clinic system combined with Central Workshops, the Army found not only that the cost per man treated was enormously reduced, but that the standard of efficiency in work done im-

proved greatly, for adequate supervision now became possible, and if this was necessary with properly qualified Dental Officers, how much more necessary will it be now that a large number of men without academic qualifications have been admitted to the register for the sole reason that they have been in practice for five years.

Now Dental treatment divides itself into two classes: Conservative Treatment, *i.e.*, reparative, saving teeth by filling, and Radical Treatment, *i.e.*, extraction of unsavable teeth and provision of Dentures. The former is often a lengthy and tiring process and needs skilful and conscientious work, the latter is largely in the hands of the mechanic in the workshop. Unfortunately, the class of people for whom this work would be undertaken in a Public Dental service, if they have had any treatment at all, have been the patients of the unregistered practitioner, who for the most part was working on commercial rather than professional lines, and, having neither the skill nor the desire to conserve teeth, have been educated against conservative treatment and look upon it as an unsatisfactory proceeding. Also the Commissioners, above referred to, definitely state (Section 141): "Satisfactory conservative treatment of the teeth of the present adult population is not possible, owing to past neglect. A large amount of Dental work is, however, needed for extraction, and the provision of Dentures." Consequently it would be necessary for the new service, whilst supplying the latter need, gradually to educate their patients to the benefit of the former, and here is the answer to the problem both as to how this matter can be undertaken and how it can be paid for.

I understand that the Board of Education have found it necessary to make small charges for spectacles provided for school children, so that these might have some monetary value to their recipients. In a similar manner it would be advisable to charge small fees for artificial dentures, to be paid for direct by the patient, whether they had paid some sum of money indirectly, by insurance subscription or otherwise, and this sum should be such as to leave a profit over the workshop cost of the denture, as would, to a very great extent, pay the working expenses of the clinic, allowing all conservative, reparative work, to be done without fee.

I do not go into figures, but from the very careful balance-sheets kept during three years at a large Army Central Dental Workshop, which balance-sheets are, I believe, at the disposal of the Ministry of Health, the cost per denture made under these circumstances can be reduced so low that, for a figure within the reach of almost all, such a large amount of money would be contributed as to make the clinics almost, if not completely, self-supporting.

Under these circumstances the hope of the Members of the Departmental Committee may be realised, even in these days of economy, and some form of State Dental Service is within the bounds of Practical Politics.

Difficulties arising out of the Change of Policy in Housing, by EDMUND R. ABBOTT, Clerk and Solicitor of the Ruislip-Northwood Urban District Council.

(ABSTRACT.)

I SUPPOSE everyone will agree that the question of providing housing accommodation for the working classes has always been a matter of difficulty.

In rural districts, from time immemorial, housing accommodation for the farm labourer has never been provided upon an economic basis, that is to say, the rent paid has never been in real proportion to the cost of the house and the annual expense of annual upkeep and outgoings.

This has not applied to the same extent in urban areas, but for many years past, in consequence of the standard required for sanitary reasons, the ownership of this class of property has not been an attractive form of investment ; frequently the whole of the rent of a house for a year has had to be expended, say, in providing new drainage, and, taking this liability into consideration, one frequently hears from owners of small property who do make an effort to keep their property in a good state of repair that there is very little left on the credit side of the balance sheet.

Local Authorities have rightly insisted upon a much higher standard of repair and maintenance than formerly, with the result that the ordinary investor has preferred to put his money into stocks and shares rather than into bricks and mortar, and this tendency has increased considerably during the last ten years owing to the higher rate of interest which can be secured in sound investments.

The legislation introduced in 1910 in connection with the duties on land values had a most detrimental effect upon investment in land, perhaps more theoretical than actual, but nevertheless added considerably to the difficulties of the provision of small houses.

At the close of the war the very serious shortage of houses was such as to need drastic remedies, and hence the policy of Parliament outlined in the Housing Act of 1919.

Local Authorities and their officials as a whole threw all their energies into carrying out this policy, and with a great measure of success, because, whatever may be said by the uninformed, there are scattered all over the country thousands of houses certainly of a better type and laid out on lines far superior to the old rows of miserable streets all of the same kind such as we were accustomed to in the last century.

Some 176,000 houses have been erected or are in course of erection under

Assisted Housing Schemes carried out by Local Authorities under the Act of 1919, and the question arises, What of the future?

When a Government is uncertain (as is the case with the present Government) concerning the policy which it should adopt, there is special need for such Congresses as this, expressing their views with no uncertain voice in favour of the steadfast pursuance of a great housing policy.

In this Conference of members and officials who are daily concerned with the question of public health, it is quite unnecessary to enforce the necessity of good housing conditions. We all know that so long as the people are dwelling in old, airless and dilapidated houses all efforts at improving the conditions of health are more or less thrown away.

It is quite useless to send tuberculous patients to sanatoria, and when they have been to some extent restored to health to bring them back to hovels in back streets. This is sheer waste of effort and money.

The first question to face, then, is how far it is possible, having due regard to the interests of the ratepayers, for a Local Authority to now undertake housing schemes without assistance from the State. The following statement of the annual income and expenditure in connection with a house consisting of living room, scullery, parlour and three bedrooms will give some idea of the liability of the Local Authority :—

Cost of House, including Cost of Land, Roads and Sewers, say £500.

Income.	£	s.	d.	*Expenditure.*	£	s.	d.
Rent at 10s. per week, excluding rates, taxes, and water charges	26	0	0	Repayment of principal and interest of loan at £5%	26	7	3
Balance against Local Authority	6	17	3	Allowance for repairs, 15%	3	18	0
				Do. Empties and cost of collection, 10% ...	2	12	0
	£32	17	3		£32	17	3

If the inclusive cost of the house were £400, the loss would be only £1 11s. 10d. per annum, and if the money could be borrowed at £4% instead of £5% there would be a balance in favour of the Local Authority of £1 17s. 2d.

It must, however, be remembered that it would not be possible to obtain a rent of 10s. per week, exclusive of rates, taxes and water charges, in a large number of districts.

The following issues arise :—

(*a*) Must not housing be looked at to some extent from the national point of view in the same way as other aspects of health, *e.g.*, tuberculosis, maternity and child welfare work, and prevention

and cure of venereal disease, and should not the Government therefore be responsible for part of the expenditure ?

(*b*) Are Local Authorities to provide houses for those people who do not reside in their district ? It seems hardly fair that they should have to do so, but frequently the districts which can least afford to do so are those where housing conditions are worst, and the districts perhaps where land is cheap and readily available have the least need of houses.

Several methods of Government assistance occur to one :—

(*a*) Lending money to Local Authorities at a low rate of interest or free of interest for a term of years.

(*b*) A grant in aid of the loss which would be incurred by Local Authorities, either on the basis of a capital grant for each house built or an annual grant per house.

(*c*) In order to meet the question of the building of houses for non-residents, an additional grant if the Local Authority would undertake to build a certain proportion of houses for this class of tenant. I know that I shall be met with the alternative of private enterprise, but, with the above facts before us, can we expect private builders to really enter the field ? Why should they when they can build a villa for £800, and let it to a tenant from £50 to £60 per annum, freeing the landlord of rates, taxes and repairs, or when they can sell and make an immediate profit ?

Of course, something depends on the action of Parliament next year, when the Rent and Mortgage Restrictions Act comes to an end. If it is renewed in its present form matters will remain much as they are at present. If it is not renewed one hardly dare think of the consequences to tenants of small property who are not in a position to buy their houses, and, again, if Local Authorities were foolish enough to adopt the policy of the Committee on National Economy known as the Geddes Committee, and sell the houses which they have already built, the position would be very much worse.

To sum up :—

(*a*) Houses must be built to provide homes for those who are living in overcrowded conditions.

(*b*) Houses must be built to replace slums, which must be demolished.

(*c*) This is a national question as well as a local one, and national funds should bear part of the cost.

(*d*) It is quite useless to look to the private builder to fill up the gaps.

(*e*) A good standard of house and lay-out of site must be maintained.

CONGRESS AT BOURNEMOUTH.

CONFERENCE II.—MEDICAL OFFICERS OF HEALTH.

Presidential Address, by W. J. Howarth, C.B.E., M.D., D.P.H.
Medical Officer of Health, City of London. (Fellow.)

I HOPE I may be pardoned if I seize the opportunity which this meeting presents to offer a few observations which will savour of propagandism. I recognise that retrospective contemplation or healthy enthusiasm for the future often furnish the material for an opening paper, but the times in which we live are so different from normal that some variation is permissible and the consideration of a few difficulties of immediate concern may appropriately be substituted.

We are all aware that as a consequence of the great outpouring of national wealth during and immediately after the Great War, the country is suffering from the effects of shortage of capital. Economy has become the order of the day. The enquiry is not "How much will such and such a proposal cost?" but "Will it cost anything at all?" To all, an appeal is rightly made to reduce expenditure, and in this reduction professions must suffer equally with trades and individuals, with the community. The trader, however, has the advantage of the professional man, inasmuch as he is able to produce a balance sheet and anxiety is reduced if the balance of accounts is sufficiently large on the credit side. The professional man, as represented by the medical officer of health, can produce no accounts. The value of his services to the public can, in greater part, only be appraised often after he has ceased his activities. Those who benefit may fail to recognise what they owe to the past activities of the local health authority, since improvement is slow and only perceptible by comparisons extending over periods of time. What is the result? Public health work is in danger of being regarded as somewhat of a luxury and in the programme of reform, expenditure on this account risks being dealt with too harshly: the medical officer of health and perhaps the profession as a whole are involved in such a misunderstanding. I leave it to the imagination of those present to develop the argument of these possibilities.

Had it not been for the unfortunate occurrences of the last few years most of us recognise that medicine would by this time have undergone great changes both in application and conception. The doctrine of the responsibility of the unit member of the community in safeguarding national health and of the close association between, and the almost interdependence

one on the other of curative and preventive medicine was rapidly approaching expression in practice in 1914. To-day, the principles are recognised but national economy prevents the ideas being fully exploited. The incompletely developed and only partial practice of the principle has resulted in difficulties arising between certain sections of the medical profession, and I limit my consideration to the difficulties (or rather are they doubts?) which have arisen between the branch we represent and that section including general practitioners. The State in its wisdom has contracted with one section of medical men to provide treatment of a specified character to a defined section of the community, and for another section, as a development of personal hygiene, has authorised the establishment of centres for treatment at which payment may or may not be required for services rendered. The officer of the local authority, the medical officer of health, acts under instructions received and the scheme evolved for this latter object may appear to encroach on the preserves of the general practitioner. It is not difficult to see how difficulties and misunderstandings may arise. The national contracting for treatment tends to commercialise medicine and, whether this is right or wrong I do not intend here to discuss, but I do assert that difficulties resulting from the set of circumstances which have evolved are not approached from the same standpoint to-day as they would have been twenty years ago when there was not State contract. There is a vast difference between a purely professional and a commercial intrusion. One is a question of tradition, the other of money, and the settlement is by a different method. The position may create discordant sections instead of a united whole, and if one or more of the sections are irreconcilably detached from the main body, advantage can be taken of the position and both be prejudiced. I need not enlarge on this aspect of the case; it must be sufficiently obvious, and if it is, the moral is equally clear. Unity is necessary, and no effort should be spared to establish a federation of all sections of medicine, and to effect this a spirit of honest compromises backed up by unswerving loyalty must be displayed.

Those of us who have been engaged in that exciting and, to members of a sister profession, profitable task of advancing or approving the claims of a great town to filch (as the attacked authority would term it) pieces out of the adjoining country area, generally without the concurrence, and often with the most pessimistic view as to the future of the residents in that area, and also with the expressed if not always real concern of the county authority, will appreciate to the full what is meant by the term "community of interest." It is regarded as including the advantages which the industry and progress of the larger area confer on those in the smaller area without the latter contributing their quota of help. The argument of community

of interest generally prevails, and though the greatest opposition to union is presented, it is not many years before those in the added area are so imbued with the spirit of local patriotism that they are as violently partizan as the oldest inhabitant. They may continue to express their resentment for years, but in any display which requires a united front they join in most enthusiastically.

This doctrine of " community of interest " should actuate all sections of the profession. Differences and disputes affecting sections are bound to arise and means for the settlement of differences should be provided. Without such, a real medical policy cannot be framed. One former member of the Cabinet rightly insisted that the views of the profession should be voiced by a body representative of all interests. The difficulty which appeared to exist was to find the body which could be generally held to be representative of the major or even most important section of the profession.

Personally, I regard the general medical practitioner as the backbone of English medicine. Whatever deficiencies can be enumerated as attaching to this group, there can be no doubt that public opinion in medical matters is materially influenced by his support or criticism. His close relationship to individual families and the esteem and admiration which generally exists throughout the country for his self-sacrificing work has placed him as the real representative of medicine in the eyes of the British public.

This fact, if it be a fact, and I honestly believe it is, combined with the growing recognition of the medical ideal that prevention is as much a responsibility of the general practitioner as is cure, renders it an essential fundamental that the medical officer of health must use every endeavour to obtain the goodwill and active co-operation of general practitioners in his public health proposals.

The differences which have arisen in the past have been due largely to misunderstandings. One group has failed accurately to appreciate the objects of the other. The means available for mutual discussion or criticism have either been inadequate or have not been made sufficient use of. This can be and ought to be avoided, and the best proposal would be one which would ensure that the deliberations of one section are aided by the presence of active representatives of the other.

The medical officers of health are associated in one body and recently the Society which represents their interests has varied its constitution to enable not only medical officers of health to participate in its affairs and management but all those who are engaged in the medical work of local authorities. Consideration is also being given to an extension of the privileges and rights of these added members. As a consequence of this progressive policy the

Society will undoubtedly be even more finely representative than it is to-day of all sections of preventive medicine.

General practitioners have several societies representing their interests, but I believe that the British Medical Association, whilst not only claiming to be representative of all sections of medicine, does actually contain a greater number of members belonging to the group of general medical practitioners than any other society. Here is an organisation which some minor change in constitution would probably fit admirably the part of the central body which could provide the necessary means for educating the different sections of medical men in their respective aims and difficulties. Particularly does the organisation seem suited for bringing into closer touch general practitioners and medical officers of health.

The difficulties experienced are that the policy of the Association is decided by the representatives in annual council assembled. At such a meeting representatives of sectional interests are not present unless of course as the representatives of areas; as a consequence a section may consider itself aggrieved by an adverse decision since the decision was arrived at without that full appreciation of the position which would have been the case had direct sectional representatives been able to take part in the debate.

These few points will indicate the lines on which it might be possible for future difficulties to be avoided. The Association may and probably does consider it is rightly entitled to be regarded as the exponent of medical policy. The claim, or the desire, is to be applauded, provided the Association can show how sectional interests can receive adequate consideration and ensure a suitable balance of judgment. This proviso is surely not a difficult one, it simply requires an arrangement with the sectional interests to join in its work in respect of matters which are of mutual concern and which require public advocacy and common action. For example, it might arrange for representatives of sections to be directly elected as such to the representative body and even before any final decision as to policy is reached educational methods might be provided for by arranging that a representative of the section should be elected to the divisions and branches of the Association and that corresponding nominees of the Association should have seats on the divisions of the Sections concerned. This reciprocal privilege should extend even to the Councils of the respective bodies.

A proposal of this kind would surely make for an agreed and uniform policy and no section would lose its individuality or freedom of action if provision were provided for separate action, though such a contingency ought to be safeguarded against by requiring the most careful and deliberate consideration and an exact statement of the difficulties in joint conference before detached action could be possible.

Whether some arrangement such as that suggested materialises or not, it is clear that our own Society must be as fully representative of those engaged in public medicine as is possible. The Society in recent years has been increasing its membership at a rapid rate, and it should be the business of every one to ensure that none remain outside. If a working arrangement with another body is decided on it would appear desirable that membership of that other body should be also regarded as a duty. In these days the cost of subscriptions is no mean consideration, but in every trade or profession there are certain fundamental expenses which must be incurred and these subscriptions I would include in that category. Much more could be said on the subject but time does not permit. My object has been to direct attention to the necessity for the greatest economy being displayed by all engaged in preventive work. If we safeguard the interests of those who employ us they will not be tempted to exercise methods which are really not economical but which, like the income-tax as a ready means of raising money, are at hand for reducing expenditure. Our proposals for the future must be of the soundest, and they must have the support of the stalwarts of the profession, the general practitioners. Proposals on which there are divided opinions are to-day more certain of rejection than ever. Practitioners and medical officers of health must get into closer touch, and to do this a greater measure of discussion in the privacy of society deliberations must be arranged. Such provision will not only assist us in the present but will greatly aid in developing that future preventive effort in which every individual member of the community will regard it as a duty to play his part.

Is the Best Use being made of Fever Hospitals, by W. Allen Daley, M D., B.A., B.Sc., D.P.H., Medical Officer of Health, Blackburn (MEMBER).

CASES of fever used to be nursed in Poor Law Institutions until about forty years ago, when a general movement set in for the erection of fever hospitals by Sanitary Authorities, and now there are in England and Wales 1,046 fever hospitals containing 37,351 beds. Some of these hospitals, however, are specially allocated for smallpox cases, though sometimes these latter are used for cases of tuberculosis or for convalescent scarlet fever cases. A certain amount of the accommodation in the ordinary fever hospitals is used for the reception of intermediate and advanced cases of pulmonary tuberculosis, but the rest of the available accommodation is used for cases of scarlet fever, diphtheria and, when they occur, typhoid and cerebro-spinal fever.

The only figures as to the cost which are available are obtained through an enquiry which I made last year when I obtained details of the expenditure of the Public Health Departments of 53 County Boroughs during the financial year 1919–20. The total cost under the heading "Infectious Diseases" included hospital treatment, disinfection and bacteriological diagnosis, but the latter two items are insignificant compared with the cost of the hospitals; the cost under this heading of infectious disease was £630,008. The total cost of all the work of the Public Health Departments, including the school medical service, was 5s. 3d. per head per annum, of which 1s. 4d. or over 25% was expenditure on infectious diseases. It may be concluded from a perusal of the individual returns that nearly one quarter of the Public Health expenditure in large towns is on the hospital treatment of cases of scarlet fever and diphtheria. There is no Government grant on this expenditure, therefore, of all the Public Health expenditure met directly by the ratepayers, considerably more than one quarter is on fever hospitals.

At the time fever hospitals were built, cases of scarlet fever were numerous and severe. The case mortality in the hospitals of the Metropolitan Asylums Board was 12% in 1871–80 and 10% in 1881–90. The total death-rate from scarlet fever in England and Wales in 1871–80 was 0.72 per thousand. Now the case mortality is less than 1% and the death-rate from 1901–10 was 0.11 per thousand, or less than one-sixth its former figure: in 1919 it was only 0.03.

Some claim that fever hospitals are responsible for this reduction in the death-rate, but I must confess that personally I am sceptical about it, and we have no real evidence that there would not have been the same change of type of the disease in the absence of fever hospitals.

We still use for the control of mild scarlet fever the same methods as were

evolved thirty years ago, when it was quite a different disease. The general public, and often we ourselves, treat scarlet fever contacts as pariahs. Doctors and parents, therefore, insist on our receiving children with scarlet fever into our hospitals : it is possible that when wards are crowded suppurative conditions of nose or ear may develop. Mistakes in diagnosis are bound to occur in mild cases : in the Metropolitan Asylums Board hospitals they number about 10 per cent., and owing to insufficiency of small wards a misdiagnosed child may have to be exposed to infection in the general ward.

To keep a child in hospital for four weeks costs some £12 to £16. Scarlet fever patients have often infected others before removal to hospital. The influence of hospitals on preventing the spread of scarlet fever is small, and as for treatment it is in most instances possible for the parents to provide adequate medical and nursing attention sufficient for these mild cases at home : therefore, in my opinion, the ratepayers should not spend £12 to £16 on the hospital treatment of a mild case of scarlet fever ; but, of course, there are occasions when a case, even a mild one, cannot conveniently be nursed at home, for example, in hotels, schools, shops, etc., and sometimes the disease is so severe that skilled nursing such as can only be obtained in hospitals is required. I must say, however, that treatment by ointment by peripatetic nurses does not appear to be necessary, though much may be said for supervising isolation and treatment at home by a nurse : the cost of a nurse who can supervise twelve to fifteen families being little more than that of keeping one patient in hospital.

With regard to diphtheria, again, the value of the hospital is for treatment and not for isolation, and practically every case of diphtheria should have hospital treatment. Similarly, true cases of enteric fever and cerebrospinal meningitis, both rare diseases now, also require skilled nursing.

The standing charges of a hospital are great, and if we curtail the scarlet fever admissions the actual saving may be only small as the cost per patient will increase so much. Measles and whooping cough are far more deadly than scarlet fever : the patients die in large numbers of pneumonia, for the treatment of which efficient nursing is so important. In 1920 there were 7,190 deaths from measles, 4,401 from whooping cough, compared with 1,430 from scarlet fever, and 5,641 from diphtheria. In fever hospitals, where the wards are suitably arranged, cases of measles and whooping cough should be admitted. Similarly, if severe cases of ophthalmia neonatorum and their mothers were admitted the vision would be saved in many cases where it is now lost.

I think I have said sufficient to show that we would obtain better value for our expenditure on fever hospitals if we admitted fewer scarlet fever cases and took in their place those of measles and whooping cough complicated by pneumonia, and cases of ophthalmia neonatorum.

Propaganda Work for the Education of the People in Health, by JAMES WHEATLEY, M.D., D.P.H., Medical Officer of Health, Shropshire C.C.

HEALTH propaganda is for two purposes. The first and principal one is to show persons how they can live healthy lives and to induce them to follow the laws of healthy living, and also to show parents how they should bring up their children so that they will be well-grown and free from disease.

The second purpose of propaganda is to create an enlightened public opinion in health matters. Such a public opinion would make the work of the Medical Officer of Health much easier and much more effective, and it would help to create a health conscience, so that a person directly neglecting his health would be looked upon as more or less of a criminal and acting against the interests of the State.

Health propaganda should, if successful, result in improved physique and decreased disease. These are not synonymous although to a considerable extent inter-dependent.

In order to estimate the possible results of this work it is desirable that clear ideas should be formed, in the first place, as to the amount of disease that is preventable, and secondly as to the amount that can be prevented by personal effort, or by communal effort only, or by a combination of the two.

As a broad proposition I think we may say that all disease is preventable. Inheritance accounts for defects, qualities, weaknesses, and tendencies to disease, but disease is produced by environment before or after birth.

Diseases that require communal action to prevent them are mostly those due to infections transmitted from person to person or animal to person, either directly or through the medium of food or water. The control of these diseases depends greatly upon communal effort, but even here personal conduct is an important factor, and in the case of tuberculosis perhaps the most important.

Leaving out of consideration the acute infectious diseases, in which the infection is able rapidly to overcome the resistance of the body, at least for a time, the usual sequence in the production of disease is improper food and feeding, insufficient exercise in the open air, the consequent failure or disorder of function of some organ or organs and the grafting on of a chronic infection already present in some part of the body. This focus of chronic infection is also very frequently due to some defect of food or exercise.

The prevention of this mass of disease, probably constituting by far the largest proportion of all diseases after youth, depends principally upon individual knowledge and effort. Communal action can, however, safeguard the food, give facilities for exercise, and improve dwellings and air, and so render personal effort more effective.

Attention to the laws of healthy living is the only radical way of preventing ill health. A supplementary method is to keep a sharp look-out for the beginnings of disease and apply immediate remedies. To my mind the greatest result that will accrue from the study of beginnings of disease will be the light it throws upon the cause of disease and consequently on the laws of healthy living. We have not, so far, sufficiently recognised the enormous benefit conferred by some diseases in acting as sign posts showing us where we have deviated from healthy living. The benefits conferred on us by typhoid fever and tuberculosis, scurvy and beri-beri, and now by dental caries, will prove in the long run to be overwhelming, but only if we utilise the lessons we learn from them, in our research into the fundamental laws of healthy living.

The great future of public health lies in research and teaching the people.

It is recognised that the educational side of the Maternity and Child Welfare and the Tuberculosis schemes is by far the most valuable part of the work under these schemes.

Is it a fact that health education is only required in connection with the care of children or in connection with one specific disease ? It is true that it is easier to persuade parents to carry out measures for the health of their children than to take the same care for themselves. The young adult can probably be influenced most easily by putting before him high ideals of physical efficiency and giving him greatly increased opportunities of making himself physically fit. It is not so difficult to influence those in later middle life or past middle life, but unfortunately in these, habits are frequently fixed and the onset of disease often showing itself.

Health propaganda work will prove to be extremely arduous and difficult, and every available means should be used. Lectures, cinemas, newspaper articles, advertise the subject and help to form public opinion ; teaching in the homes of the people by medical practitioners, nurses and health visitors, and in the schools by school teachers, gives the detailed instruction. The proper training of medical practitioners and their payment for this work is in the dim future, and for the present we must strive for the public health training of nurses and health visitors and for the better training of teachers in the training colleges.

A nurse's work is concerned to a great extent with improving the environment of her patients. She should, therefore, have a sound knowledge of hygiene, and her training should be based to a large extent on physiology. A body of district nurses so trained would help greatly in health propaganda throughout the rural parts of the country.

Of all nations, we are probably the best protected from physical dangers owing to our excellent sanitary organisation. It is impossible, however, to

make a people strong, vigorous and well developed by protection only, and there is much evidence to show that in physical development we occupy a low position amongst nations. I would plead very strongly for health propaganda, particularly with regard to food and exercise, to be put in the forefront of public health work. It should be made a duty of public health authorities and a liberal grant from the national exchequer should be available for it. The necessity for economy is a strong additional reason for commencing this work, for it would be the most economical work ever undertaken by a Government.

Are Venereal Disease Clinics Fulfilling their Functions, by D. MORLEY MATHIESON, M.A., M.D.(EDIN.), D.P.H., Medical Officer of Health, Birkenhead.

THE question of the success or failure of venereal disease clinics is the question of the success or failure of venereal disease schemes as a whole. It is impossible to detach the work of the clinic from the work, for example, of private medical practitioners, or of agencies concerned chiefly with the education of the public. The clinic is the organic centre of the whole.

It might be urged with justice that the existence of a sound relationship between V.D. officers and their medical colleagues is the most important factor in the success or failure of a V.D. scheme. It is obvious that the best results can be obtained only where the V.D. officer is regarded by the local practitioners as a specialist in his subject. This is not likely to obtain unless—

(*a*) the V.D. officer be allowed by his local authority to have private consulting practice (that is, to see patients in private *if called in by the patients' medical attendant*).

(*b*) the V.D. officer, in those areas where the clinic is at a general hospital, be given recognition as a consulting surgeon on the hospital staff.

Where these conditions exist the V.D. officer has an effective status, his work carries with it the authority which it deserves to carry, and there is every chance of his knowledge and experience being fully utilised. Where the V.D. officer is regarded as in a lower category than that occupied by the consultant staff of the local hospital he is handicapped from the outset.

It may be objected that such a degree of medical recognition is no more deserved for the venereal diseases officer than it is for other clinical public health officers, for example those engaged in the diagnosis and treatment of tuberculosis. This is not disputed. Much that is so disappointing about

tuberculosis work is directly traceable to the relatively insignificant status accorded to the tuberculosis officer by the local profession. Although tuberculosis schemes have been in operation for over ten years, the majority of tuberculosis officers have not sufficient organic relationship with the general medical practitioner ; only in a minority of instances are their services widely utilised in a consultant capacity. How many medical officers of health can record that the general practitioners in their areas whole-heartedly co-operate with the tuberculosis officer, with a view, say, to the early detection and treatment of tuberculosis ?

There are areas not yet supplied with clinics ; there are other areas where the existing clinic accommodation is far from ideal ; and there are clinics which are open at inconvenient times : by far the majority of male patients can attend only in the evenings, unless they sacrifice their work.

Again, there are large numbers of patients who cannot attend clinics regularly for treatment, particularly patients resident in county areas ; and others do not care to do so, the well-to-do class on the one hand, on the other the working-class patient who prefers to pay for private treatment. It may be questioned whether the treatment obtained by these patients is always, or indeed frequently, up to the highest possible level.

The fact cannot be evaded that clinics have not been the agents of medical education which it was hoped they might prove. Only a small minority of practitioners have availed themselves of the facilities offered by the clinics for familiarising themselves with modern procedure in treatment, either of gonorrhœa or syphilis.

The reason for this may be partly personal, partly one of organisation. Undoubtedly, the V.D. officer who is highly trained, efficient, and an enthusiastic worker, has the greatest chance of attracting men to his clinic. With regard to organisation, consideration should be given to the question of the employment of local medical practitioners at V.D. clinics as part-time assistants. Practitioners so employed would be engaged for a limited period, attending say one session per week for three months, and might receive a payment, say, of £10 at the completion of the period. Not more than one such practitioner would be in attendance at any particular session. With such a system in operation it would be possible quickly to increase the number of men capable of treating cases of venereal disease in their own surgeries on modern lines.

An essential in the remedial process is the securing of the continuance of treatment without interruption up to the point of cure. Here we find a weakness in the present arrangements which is becoming increasingly obvious, and which must be dealt with if V.D. schemes are to continue.

It is unfortunate that the treatment of venereal disease should effect

the removal of symptoms and obvious signs long before cure is reached, and long before the patient ceases to be a source of infection to others. The natural tendency is for the patient's interest in the treatment to slacken off with the clearing up of the obvious trouble, and for him to discontinue treatment at this stage. In the two years, 1919, 1920, 59,000 patients at V.D. clinics in this country ceased attending before a course of treatment had been completed, and 15,000 more before the final tests for freedom from infection had been made. Money spent on a course of treatment prematurely ended in this way is money wasted. Very little real good is done, and indeed it might be agreed that actual harm is effected, inasmuch as the patient has developed a false sense of security, and is, therefore, rendered all the more dangerous.

The medical officers of venereal diseases clinics have no powers such as enable the medical officers of poor law institutions to detain patients who are in an infectious state until they are fit for discharge. (Poor Law Amendment Act, 1867, Sect. 22.)

The personality of the doctor is, of course, a factor which is of great importance in this connection. It is useless to adopt old-fashioned out-patient department methods in dealing with V.D. patients ; each has to be talked to and reasoned with, and the influence which some V.D. officers are able to exercise over their patients is remarkable. Returns from different clinics show great variation in results, though in comparing the figures of one area with those of another it must be remembered that the standard of cure recognised varies greatly.

Measures of persuasion other than those employed in this country are in operation in the United States, where male and female health visitors are employed to attend at the clinics and talk to patients on the social side of their condition ; leaving the doctor with the purely medical work of the clinic. Contacts are encouraged to attend the clinics ; patients are given numbered cards, and anyone presenting these at the clinics is examined without any questions being asked.

The very large proportion of patients who in this country commence a course of treatment and do not complete it (50 per cent. is probably a fair estimate) is forcing those engaged on V.D. work to the conclusion that purely persuasive methods will never be sufficient, and that the introduction of some compulsory measures to secure continued treatment in those cases where all persuasion has failed is urgently necessary.

In Australia, South Africa, many of the American States, Sweden and Denmark, such powers exist, and are being used with marked success.

At the present time Liverpool, acting on the advice of Dr. Hope, and with the co-operation of Birkenhead, Wallasey and Bootle, is contemplating

approaching the Minister of Health, with a view to the introduction of regulations to deal with this matter. The object of such regulations would be chiefly to make it compulsory that—

(1) Any person suffering from V.D. must consult a doctor.

(2) Any person under treatment for V.D. must remain under treatment until he is considered to be free from infection.

(3) Any doctor whose patient discontinues treatment prematurely without sufficient reason must notify the facts to the local Medical Officer of Health.

(4) A Medical Officer of Health receiving such a notification must investigate the case and, unless satisfied, must lay an information in a Court of Summary Jurisdiction.

The introduction of such regulations five years ago would have done little good. To-day some modified system of notification would appear to be not only desirable, but necessary, if the present expenditure out of public funds in venereal diseases work is to be justified. As to the probable effectiveness of such a limited compulsory measure there can be little question. It has been urged that any form of notification would tend towards concealment of disease. This has not proved to be the case in the Colonies. The bogey of " sex-discrimination " has been raised ; medical practice in this country is hardly likely to discriminate unfairly between the sexes ; and in Canada it has been found that the number of women dealt with under compulsory powers has been actually smaller than the number of men. Difficulties might arise occasionally from false names and addresses being given, but this is hardly a practical objection. As to the criticism that the treatment of venereal disease is a confidential matter, and that any form of notification would violate the confidence placed by the patient in his doctor, this really applies to all diseases ; with notification established in law, and the law within the patient's knowledge, the question of breach of confidence would not arise to embarrass the doctor.

The prevention of venereal disease is to be promoted on the same general lines as that of any other infectious disease, by isolation of the sick and education of the healthy.

(*a*) Isolation in venereal disease, however, does not mean the treatment of an infectious case as a hospital in-patient ; it means essentially sexual isolation. Here again the influence of the doctor on the patient is the decisive factor. The doctor must not content himself with a casual warning ; he must discuss the question with his patient from every point of view, his duty to the state, to his wife, to his unborn children. It is necessarily difficult to measure the extent to which V.D. schemes have proved successful in this regard ; there is certainly no evidence sufficient to justify complete optimism.

(*b*) The tracing of sources of infection through information obtained at V.D. clinics is a preventive measure which, for obvious reasons, has been developed only to a limited extent. From time to time cases can be dealt with where the infecting agent is a member of the patient's family. Whether more extensive work will become possible is a matter for future investigation. It is well-known that men patients can frequently tell where in all probability they were infected; and that prostitutes may be the means of sending case after case to a V.D. clinic without coming under treatment themselves.

(*c*) To the more general measures for the prevention of venereal disease only brief reference need be made, as they are less directly concerned with the work of the clinic. Education of the general public has formed a part of all V.D. schemes; chiefly by means of lectures and cinema shows. There can be no doubt that good has been done in this way, and that much yet remains to be done. There is, however, some danger that too much reliance may be placed on what might be called get-wise-quick methods. The cinema produces a vivid but extremely transient impression; this has its value, but the duration of its effect should not be over-estimated; and the nature of the subjects dealt with should be most carefully scrutinised. Another danger to be avoided, in this matter of propaganda, is that associated with the altercations openly indulged in by rival Societies; these are to be deplored as tending to undermine the confidence of the public. . . . After all, discreet legislation is the great educator; the Infectious Diseases Act of 1899 did more to establish in the public mind a conviction as to the danger of the common infectious diseases than innumerable lectures would have effected; and the introduction of any scheme of notification of V.D., however modified, will have more educational effect than the most extensive publicity campaign.

The abolition of known centres of prostitution is a matter of extreme difficulty, but the dangers associated with the continuance of unofficial tolerance of prostitution cannot be overlooked.

The question of the provision of counter attractions to promiscuous sexual indulgence is a constructive problem of the very greatest importance. Perhaps the most urgent social need of the day is that for greater healthy recreation facilities for youth and young manhood and womanhood, especially in our large towns.

Are the Present Methods of Disinfection Worth While? By T. W. Naylor Barlow, O.B.E., M.R.C.S., D.P.H., Medical Officer of Health, Wallasey (fellow).

ABOUT twelve-and-a-half years ago I read a paper before the Society of Medical Officers of Health entitled "Disinfectants: their scientific uses, their quack uses and their dangers." In that paper I pointed out that there were, on the market, very many substances called disinfectants, which had no germicidal properties whatever, and that even with regard to those substances which were genuine germicides, in the vast majority of instances the dilutions in which they were used, and the purposes for which they were used, represented quackery in its most objectionable form. No doubt some improvement has taken place in the intervening years, since 1910. For example, I imagine the practice, at one time, of mixing disinfectants with the water for watering streets does not now obtain. I imagine also that the useless and the hopeless practice of trying to disinfect (save the mark!) drains and sewers by pouring weak solutions of disinfectants down them is not so widespread as it used to be. It is unthinkable in these days that it would be thought necessary to "sprinkle with a strong solution of disinfectant" an exposed public place, as a precaution against the spread of plague. This was stated by an enterprising but obviously non-scientific reporter in one of the Liverpool papers as a fact to have been done about the time I wrote my first paper. It still remains true that, during recent epidemics of Influenza, some of the uses to which disinfectants were put reached the high water mark of credulity and stupidity; and, even in these piping days of peace, when there are no epidemics raging, one notices that it is a common practice in Cinemas, especially so-called up-to-date and luxurious Cinemas, to send round at intervals a small boy, arrayed in gorgeous uniform, armed with a squirt filled with some odorous material (possessing a pine smell for choice), whose duty it is to discharge this odorous liquid into the air in the form of a spray. What it is hoped to accomplish in this way by disinfection nobody knows, but the average layman fondly hopes and imagines that in some magical way the air has been disinfected, and that he has been saved from some noisome infectious disease. I would suggest to the Cinema proprietors that they are not only wasting their money in purchasing this liquid for this purpose, but, in addition, they are wasting the valuable time of the boy. They should remember that, even if it were possible to disinfect the air by the means described, it is much cheaper, far more expeditious, and in every way preferable, to change the air in the building frequently, which

can be done in a few seconds by an efficient means of ventilation, and by opening the windows. The former "Grande Passion" of enclosing solid odorous materials in cages in urinals has not yet completely gone by the board, and in these days of enforced economy I suggest to all the Steamship Owners, Railway Companies, and the like, that the abolition of these would enable them to save a few hundred pounds for the benefit of their shareholders without detriment to their passengers. What is wanted is clean, well ventilated urinals. There would then be no need for counter-smelling substances. There is a very widespread idea as to the extreme potency of a disinfectant. Judging by my own experience, this is held by the public generally, all midwives and nurses, many doctors, and, dare I say, by a few, but very few, Medical Officers of Health. The idea is that one has only to show a disinfectant to a micro-organism for the latter to immediately curl up and die. As a matter of fact, all medical men know, or would know if they stopped to think one instant, that every micro-organism requires, in order to kill it: (1) a certain strength of the solution, (2) a certain time exposure to the solution, this latter time being greater as the dilution is weaker; and, moreover, that the temperature has a modifying effect on the action of the disinfectant, being more potent hot than when cold. I remember hearing a paper by the late Professor Délépine on this question of disinfectants, when he distinctly stated that very dilute solutions of some of the best known disinfectants, when mixed with culture media, acted as a stimulus to the growth of micro-organisms; in other words, their properties in these solutions were not germicidal but stimulative. If we bear these simple facts in mind and look around us, we would, I think, come to the conclusion that, even in these advanced times, disinfectants are more abused than properly used, invariably by the public, almost invariably by midwives and nurses, and not uncommonly by medical men. Let us take a few examples. :—

(1) The midwife and the disinfecting of her hands: she takes as a rule a tabloid, *e.g.*, one which, mixed with a pint of water, forms a solution of 1 per thousand perchloride of mercury. She dips her hands in the solution for one or two seconds (with or without a preliminary washing) and then fondly imagines that all is well.

(2) A nurse in the School Clinic or out-patient department of a Hospital: she invariably has at her elbow a bowl containing a weak solution of Lysol, or some other so-called disinfectant, in which she, from time to time, dips for a second or so any instruments she may be using, in the belief that, as a result of that momentary dipping, she is using a sterile instrument.

(3) Antiseptic mouth washes and nose douches are ordered by the thousand for various causes, yet it is not possible to introduce into the nose or

mouth a solution of any material of such potency, and to keep it there for such a length of time, as will enable it to have any germicidal effect.

(4) We are in the habit of spraying the walls of rooms after the various infectious fevers with some germicidal solution, or alternatively, of burning some substance which causes the evolution of a gas supposed to have germicidal properties : It is reasonable to ask what organisms are we killing by such means. Are we really doing anything towards preventing disease ? For my part I think all house disinfection can quite safely be scrapped. While I am not prepared to deny at the present moment that it is possible to transmit disease by means of inanimate objects, *e.g.*, books, walls of rooms, &c., I will say that, as factors in the spread of disease, they are of no account and need not be considered. The chief and only factor worth consideration is the person affected and, perhaps, his clothes and bedding. The so-called disinfection of rooms by gas is futile and unscientific, especially when carried out by the ordinary disinfecting staff of a Corporation.

The list of diseases for which we are asked to disinfect is continually increasing. I am repeatedly being asked to disinfect houses after deaths from cancer, and even after an ordinary death. I have always refused to disinfect after cancer because to do so tends to make the man in the street believe that cancer is an infectious disease, and of that there is no evidence at the moment. Cancer is a disease terrible enough, both to the sufferers and to those around them, without having added to it the additional fear of possible infectiousness. We are very apt to forget that the best disinfectants of all are the cheapest and most easily obtainable, namely : boiling water and sun. I think there is a very distinct danger in the public being educated as they have been as to the value of disinfectants, especially when this knowledge is used at the expense of cleanliness. What we ought to teach them, and continue to teach them, is the value of soap and water, and, when these are used to their fullest extent, there remains very little for the disinfectant to accomplish.

At a time when we are all seeking to cut out all unnecessary and unprofitable expenditure I suggest that here an opportunity presents itself of saving a little money, even if only a few pounds annually, but in addition there would be saved a considerable amount of the time of the disinfectors, and, perhaps, most important of all, we would redirect the education of the public on to lines from which, in the last few years, they have diverged to a considerable extent.

CONGRESS AT BOURNEMOUTH.

CONFERENCE III.—ENGINEERS AND SURVEYORS TO COUNTY AND SANITARY AUTHORITIES.

Presidential Address, by NORMAN SCORGIE, M.Inst.C.E., Borough Engineer and Surveyor, Hackney.

IN any sectional conference of the Royal Sanitary Institute it is the influence of the work of those who form the section upon the great co-ordinating aim of the Institute—" the public health " in the uninspired language of Acts of Parliament, " Salus generis humani " in the more sonorous periods of our motto—which is naturally uppermost in our minds and therefore the most suitable subject for my brief introductory remarks.

It is not perhaps, a side of his work which is very obvious to a modern Engineer in a busy municipality. That a town's drainage should be efficient and its streets clean are things so universal in England to-day that one is apt to treat them as natural laws independent of human effort. We are a long way from the first Public Health Act and to the present day ratepayer the expression " public health " probably connotes more about notifiable diseases, maternity and child welfare, free meals for children in elementary schools, dental clinics and such like examples of modern social service, than it does about drains, sewers and streets.

The later developments of care for the public health are mainly the result of the social legislation of the last twenty years and they were non-existent when I commenced the practice of Municipal Engineering more than forty years ago. I hope I am not so prejudiced as to ignore the valuable results which these modern services have achieved or to dismiss them as fads, and in any event I would not select a conference of this Institute as a suitable place for expressing such old-fashioned views, but one thing I do believe and this seems to me an appropriate time and place for giving expression to it ; it is that all these modern social services are but accessories. I admit that the population of a large town is an aggregation of individuals, but the aggregation, on which is based the whole of modern industrialism and therefore to a great extent modern civilisation has been and to my mind still is the basic problem of public health. The health of the public is of course, the average of the physical conditions of the individuals who form the public, but where masses of individuals are of necessity living together in a limited area the experience of the last fifty years seems to show that by general measures such as improved sanitation, cleansing, lighting,

transport, building regulations, etc., it is possible to effect a very remarkable reduction in the death rate and a general improvement in the average physical conditions of the mass. It will be for the next fifty years to show whether an equal improvement can be made by an equal expenditure of public money on welfare services directed to the individual and not to the mass. Few of us will be here to see the result, but without disparaging the newer methods let us emphasize the proven results of the older ones. It is Municipal Engineers who have been the foremost instruments of the older methods of improving the public health, and as one who is not likely to be many more years in practice I would like to appeal to younger men not to forget the valuable contribution their profession has made and still can make to the public health in the mass, leaving to the Doctor and the Specialist all the work they can find to do for the individual. The whole is still greater than the part. With all its successes with serums and anti-toxins, and with all the assistance it can obtain from surgery and bacteriology the fundamental problem of preventive medicine is still the problem of assisting natural resistance to disease, and nothing has yet given such results as bettering the general conditions under which the mass of the people live.

The Engineer still has a large part to play in that betterment. Firstly, he must hold firmly to what has been achieved. As I have said above, good drains, clean streets, an abundant supply of pure water are regarded as natural conditions. They are not natural conditions. Recent years have shown us that the whole basis of modern civilisation is liable to attack. Sanitation and cleanliness cost money. In days of economic stress we must be vigilant that money which cannot be found twice is not spent on the accessories of public health instead of on the fundamentals. In the Great War the success of vaccine inoculation against typhoid and enteric was almost complete, but the toll of these diseases in previous campaigns was due to the drinking of dirty water. Millions of men had to be inoculated against the results of drinking dirty water abroad. In this country we have pure water supplies and it is cheaper to maintain them pure than to provide free clinics and free vaccines in every town and village and a registration system for seeing that every inhabitant is inoculated once every two years.

Secondly, the Municipal Engineer must realise that most of his newer activities are directly in the interests of the public health on the old and proven lines, and therefore where money is limited they should have precedence over social services to the individual on experimental lines. Town planning and the provision of parks are perhaps obvious, although in this beautiful town one is perhaps apt to take them more for granted than in congested districts such as some of us have to work in. Indeed I see from

the Programme that the Borough Engineer and Surveyor has deserted us and has gone over to the section on Architecture, and one realises that having in his town all the material amenities that the most exacting could ask for he is able to turn his attention to the artistic side of our profession, a happy choice that few of us can hope to achieve.

But, in addition to the obvious there are some very material things which have a direct bearing on the public health. The construction of good roads which will without undue expense stand up to modern traffic is a very material and pressing problem not yet adequately solved. The solution is often regarded as a matter chiefly affecting the so-called pleasure motoring or capitalist class. In fact the problem is a large part of the modern transport difficulty which is a very important factor in the public health. The making of a good road cheaply may not seem to have such a direct bearing on public health as the discovery of a cheap and practical method of purifying milk without destroying its nutritive value, but if we can bring it about by good and cheap transport that expectant mothers live and babies are born in pure air amid healthy surroundings even though they drink moderately dirty milk we shall perhaps have done more to improve the health of the next generation than if we continue to herd the population in crowded slum areas and feed the individual mothers and babies upon the purest milk at the ratepayers' expense.

An Engineer and Surveyor is not likely to be an idealist, even if his Council would let him, his work is too practical. But since an idealist is often too occupied in admiring his ideals to do anything towards achieving them, that is perhaps no loss. An Engineer is a worker, and every man works the better if he can see some purpose in his work beyond the daily toil and the monthly salary cheque. To some of the great ones in the engineering profession their life's purpose may seem to be the conquest of nature by man. To those of us in municipal practice there is no opportunity of building a Forth Bridge, an Assouan Dam or a railway over the Andes, even if we had the ability. Few of us will even invent a revolutionary method of construction. But we serve no mean purpose if the public health of some small part of our country is the better for the work we have done.

Seaside Health Resorts, by F. P. Dolamore, F.S.I., Borough Engineer and Surveyor, Bournemouth (Member).

IN the old days the title Health Resort conjured up a picture of a procession of invalids in bath chairs and otherwise, an Eldorado for medical men, but a place to be shunned by those who still enjoyed a measure of health.

The health resort of to-day is more concerned in providing recreation and amusement as a stimulus to both mind and body, to keep the machine in good condition rather than wait for the inevitable breakdown, and then attempt a cure.

The result of this evolution has been that the line of demarcation between a health resort and a pleasure resort has disappeared. We now recognise that reasonable pleasure and entertainment are part of every cure, or better still, of that prevention which is better than cure.

The engineer to a seaside resort to-day finds himself involved in the design and upkeep of works more immediately concerned with the enjoyment and entertainment of the people than was dreamt of in past years.

It is always profitable to consider the ideal as an incentive to approach as nearly as possible to it.

No one set of climatic or other conditions can be considered the best for all persons, so long as we differ so vastly bodily and temperamentally.

Surprise, however, must not be expressed if it is claimed for Bournemouth that it is the nearest possible approach to the ideal, and for the following reasons :—

Bournemouth Bay forms a crescent six miles between the horns, facing full south, and thus receiving all the beneficent influences of both sun and sea breezes. The advantages enjoyed by seaside towns of this aspect are obvious, but Bournemouth has two unique features which make for fuller enjoyment.

Firstly, the valley and chines running at right angles into the heart of the town, act as ducts or distributors of the purified air.

Secondly, the double tides which prevail here mean that the waters of the bay set in different directions eight times instead of the usual four in each twenty-four hours, and are consequently more active in their purifying and enriching influence upon the air.

All these are natural advantages, and are mentioned only to stress on fellow engineers the necessity of securing, so far as may be possible, these advantages unimpaired by judicious planning. It is a fact, however, that

few have the opportunity to mould their town's lay-out to any great extent. Largely, the place has to be taken as it exists. In order to secure circulation of air it is of first-class importance that wide roads should be planned leading inland from the sea front, even when the traffic demand would only seem to justify such thoroughfares running parallel to the front. For the same reason terraces of houses should be avoided. Many a town presents one long line of terraces when approached from the sea. Such a state of things must be prejudicial to the citizens dwelling behind such a barrier. There are few who have not experienced the condition of atmosphere in the yards and courts behind long terraces of shops and lodging houses. It may be quixotic to hope for legislation forbidding the construction of terraces beyond a certain length.

The provision of parks other than on the sea front is not generally so liberal as in the case of Bournemouth. There is a danger of yielding to the temptation of concentrating on the visitor and the sea front, to the neglect of the resident and the rest of the town area. Bournemouth has been particularly fortunate in having old Poors Commons in the borough, which have been secured for parks, and have been laid out for golf and other games. The value of such means of healthy enjoyment in the open cannot be overestimated.

A healthy town cannot exist on a damp or water-logged sub-soil, and it should be the object of every engineer to endeavour to arrange that any such areas in his town are secured as open spaces. It is unfortunately true that such areas more often become the sites of small properties, carrying large populations.

Bournemouth has sand and gravel as a sub-soil. The ground dries in a few hours after rain, and very often a drenching downpour in the morning is followed by dust in the afternoon.

Proper drainage is, perhaps, one of the factors in the health of a borough. The writer has to confess to a grave dislike to systems where discharge into the sea is only possible at certain states of the tides. In Bournemouth the levels are so favourable that discharge takes place at four points, at all states of the tides. But here for many years the not unusual experience was suffered of a nuisance arising from ventilation shafts at the higher parts of the borough in certain conditions of the atmosphere and direction of the wind. This has been satisfactorily remedied by cutting up the sewers, so far as possible, into sections by means of tumbling bays with traps for branches and flap traps on the main lines; each section is provided with shafts which act as expansion pipes. The pressure is thus equalised, and the amount of fouled air discharged at any one point is reduced to a minimum.

Perfect as the public sewers of a town may be, however, the public health

cannot be guarded without similar qualities in the private drains and fitments of houses. In this respect Bournemouth owes much to the ability and enthusiasm of its Sanitary Inspector and Building Inspector.

It is not the road to popularity, but it is better to ask for too much than too little in the sanitary fitments of houses.

Building by-laws are also not a popular subject, and are very difficult so to draft as to apply reasonably in all cases, and are more difficult still to administer.

The old Model By-laws are far from perfect, but when administered sensibly they have worked greatly to the good of the community.

The recent relaxation of by-laws as a war emergency measure has been regrettable from an Urban District point of view, whatever justification there may have been for such a measure in rural districts.

The post-war period has been one of revolution in traffic, and the Highway Surveyor has been hard put to it to keep his road surfaces in a proper condition under the new fast moving rubber tyred vehicles that now abound. A greatly increased expenditure on asphalte macadam and similar pavings will be necessary.

Without a really good surface no highway can be properly scavenged, and a road improperly scavenged is a danger to public health.

To a healthy community it is essential that house refuse collection and disposal should be efficient. The individual should realise that refuse should be put in the bin, and not shot in and around it, as is so often done. Experience shows that very often the most severe critic of municipal service is most slovenly in this respect. Back yards and areas are the greatest contributors to the fly and other nuisances, owing to lack of cleanliness.

Only by the united effort of the people with the official can the ideal of cleanliness and healthiness be approached.

Town pride and patriotism can accomplish wonders, and it will be a great day when they replace the present antagonism which faces the keen official so often.

The Hygiene of an Inland Health Resort, by C. E. Rivers, A.M.Inst.C.E., Borough Engineer, Harrogate.

HYGIENE has been defined as the science which teaches us how to keep the body in health, and therefore it would seem that the subject matter of this paper is one which could only be dealt with by a medical man. Whilst, however, the physician is more immediately concerned with the prevention and cure of disease, the municipal engineer is intimately in touch with the development of all matters which have for their object the improvement and maintenance of the public health of the community.

Of the two factors, personal and environmental, which determine perfect health, the latter, perhaps, chiefly comes under the purview of the municipal engineer. The hygienic conditions of a town depend to a great extent on its locality, site, soil, air, the purity of its water supply, the excellence of its sanitation, sewerage and sewage disposal, the planning and disposition of its dwelling houses, the cleanliness and repair of its highways, the disposal of its refuse, and its provision of open spaces (which have rightly been termed the lungs of a town) ; and, generally speaking, the engineer is responsible in a great measure for these conditions.

Whilst the environment factor is common to all towns, it must be specially emphasised in all resorts where people repair for the benefit of health. It is essentially the duty of the governing authority of every health resort to have the greatest regard for the hygienic conditions of their district ; and whilst they may be endowed by nature with facilities for health restoration, if they are to be of the greatest benefit to the community at large, and, incidentally, to retain their popularity, they must always take advantage to the fullest extent of the means of improving and maintaining these conditions.

As this paper relates only to inland health resorts, the author may, perhaps, be permitted to refer to the town he represents, which may be described as one of the most important health resorts in the United Kingdom, if not in Europe. It can be assumed, therefore, that Harrogate could not have gained its popularity had not its municipal authority been alive to the value of maintaining and improving the hygienic conditions of the town, and of utilising to the full the mineral water resources with which it has been endowed. A few notes on the endeavours of its local authority to attain the ideal, and on the manner in which its mineral waters have been conserved and administered, may be of interest.

Harrogate is favourably situated on high ground between the Wharfedale and the Nidderdale, in the West Riding of Yorkshire, the altitude varying from 350 to 600 ft. above ordnance datum. The population of

the town (1921 census) is 38,938, and the rateable value on a new assessment is £390,166. The climate is dry, attributable, in part, to the amount of sunshine, and in part to the facilities for the rapid evaporation and thorough drainage afforded by the conformation of the district. Another feature of the climate is its stimulating and bracing air, which has an important bearing on the treatment of invalids, for it is found by experience that after a course of treatment no after cure is necessary, as is generally required at Continental Spas.

As the town is practically a modern one, the drainage and sewerage are also modern, and there are very few of the old type sewers existing. The town is drained on a partially separate system, the surface water from front streets, front gardens and front portions of the houses is drained into surface water sewers, which discharge on the outskirts of the town into open streams ; the surface water from the back portions of the houses, back yards and gardens, and back streets (of which there are comparatively few), together with the soil drains, are drained into the foul water sewers. The majority of the manholes in the town are fitted with sealed covers, and ventilation is provided by means of standard ventilating shafts 30 to 40 ft. in height ; but where they would be objectionable on account of the height of the surrounding buildings, or for other reasons, Webb's patent ventilating lamps are erected. The dead ends of sewers are provided with flushing manholes fitted with disc valves.

The sewage of the town is dealt with at two disposal works, one on the northern boundary of the borough about two miles from the centre of the town, and the other about six miles to the south-east. It was the original intention to gravitate the whole of the sewage to the latter point, but for the following reason it was not deemed advisable. The borough lies approximately on a ridge running east and west, and in order to drain the northern slope of the town to this site it would have been necessary to have driven a tunnel to the south side. There would, however, have been a certain amount of risk in carrying out this work of endangering the mineral springs, and, acting on the advice of an eminent geologist, it was decided to abandon the idea, and to adopt a separate site on the northern side for that portion of the borough.

The two sewage works are very similar in design, consisting of detritus chambers, sedimentation tanks, percolating filters (which are dosed intermittently), and humus tanks. The filtered effluent is irrigated over land before being finally discharged into the adjoining streams, the West Riding Rivers Board demanding rather a high standard of purity in this district. The sludge is air-dried in shallow lagoons, the beds of which are constructed of clinker, graded up to a fine breeze ; the liquid draining from the lagooned

sludge is returned to the main sewer. The capital expenditure incurred by the local authority in respect of sewage disposal, sewerage, etc., is about £260,000

One of the chief assets of Harrogate is the large area of open common land, known as the Stray, situated practically in the centre of the town, and upwards of 200 acres in extent. The land was acquired by the Corporation in 1893, and is to remain unbuilt on and kept as an open space for the recreation and enjoyment of the public.

There are about 21 acres of ornamental gardens and lawns, notable among which are the Valley Gardens, which, with its band stand and tea house, is the fashionable afternoon rendezvous of the visitors in the summer season. The Harlow Moor, lying to the west of the Valley Gardens, about 60 acres in extent, is kept as far as possible in its natural state, with its pine trees, heather, gorse, bracken, etc. It is within easy access of the pump rooms, and provides that walk necessary for some of the water drinkers.

It has been said that every seaside town is a spa ; I suppose from the fact that sea water, being rich in saline constituents, is a mineral water of certain medicinal qualities, but I think that it can safely be asserted that the great majority of sea bathers indulge in bathing as a pastime and pleasure, rather than from a cure point of view. The primary object, however, of people who visit inland health resorts is health restoration ; and it cannot be said that in Harrogate, at any rate, to indulge in the waters, either internally or externally, is a pastime and pleasure.

There are in Harrogate a large number of mineral springs (87 in all), arising within a radius of two miles. These are constant in yield and of varying constituents. Over 30 of these are within the area of one small field ; yet, near as they are to each other, these springs are all different in their mineral impregnation. The cause of their difference is due to the fact that the beds of shale stand in an almost perpendicular position, and each spring rising independently of the others brings to the surface its own proper load of saline matter, or gaseous impregnation ; hence we have iron and sulphur springs within a few yards of each other.

The governing authorities of the town have always had regard for the preservation of the springs. As early as 1770 an act of Parliament was obtained for this purpose, and from time to time greater powers have been granted for the conservation and administration of the mineral waters. At the present time the local authority own and control the whole of the springs in the district, and have incurred large capital expenditure in the erection of buildings or pump rooms for the serving of the drinking waters and extensive bathing establishments, where not only are the mineral waters administered for bathing purposes, but virtually every approved form of

balneological treatment has been installed therein. One of the numerous precautions that have been taken for the preservation of the springs is the prohibition of any excavation within a radius of 600 yards of the old sulphur well (the principal spring) without the sanction of the local authority. In all cases where such excavation is permitted the work is closely watched and inspected by the author's department, and wherever there are signs that the sulphur shale is being approached the excavation is immediately stopped.

In order to utilise all the resources of science in the supervision and administration of the waters the Town Council determined on a scientific survey and investigation of the various springs, and entrusted this work to Professor Smithells, F.R.S., of the Leeds University. The investigation has extended over four years, and is now complete. It has been the most exhaustive survey that has yet been made, and the results of the new analyses show that the ancient quality of the waters is fully maintained. A highly qualified analytical chemist has been appointed on the staff, who devotes the whole of his time to the supervision of the waters, in giving scientific assistance to medical men in regard to analysis for therapeutic purposes, and carrying on continuous research work on all questions relating to the waters and their medical uses.

As the result of these investigations, several valuable improvements have been made in the conservation and administration of the waters, these being now transmitted from the various springs and stored with practically no deterioration ; and, whereas under old methods there was frequently a loss of 50 to 60 per cent. of sulphur in the transmission and storage of some of the sulphur waters, the loss now in under 3 per cent.

In order to increase the efficiency of the Spa treatment, it is now necessary for all the attendants who administer the treatments to undergo a special examination, the preparation for which entails 18 months' practical experience and attendance at a series of bi-weekly lectures during the winter season extending over two years. The examinations are held periodically by a committee of medical men.

Upwards of a quarter of a million pounds of capital expenditure have been incurred in the provision of bathing establishments, and it will thus be realised that the municipal authority of Harrogate has taken every advantage of constantly maintaining and improving for the benefit of the community its special facilities for health restoration. It might be argued that these are matters which should be left to private enterprise, and that it is not the duty of a municipal authority to embark on such schemes ; but where the progress and prosperity of a town, whether a seaside or inland health resort, is dependent solely on its visitors, it can be safely claimed

that the schemes which are necessary for the improvement and restoration of the health of the people should be undertaken by the municipality.

In addition to providing the actual means for health restoration, the Corporation have realised the necessity of catering for the amusement and entertainment of its visitors whilst taking the cure. A concert hall has been erected, at a cost of about £70,000, where a variety of high-class entertainments are given, the municipal orchestra providing a large share of the musical portion of the programmes. Concerts are also provided in the gardens every afternoon in the season, whilst a small orchestra plays every morning in the Pump Room for the early morning water drinkers.

A pure and abundant water supply, well constructed highways, the cleanliness of the roads and streets, sanitary methods for the storage, collection and disposal of house refuse, are factors which are primary necessities of all health resorts, and on the efficiency of which depend the excellence of their hygienic conditions.

Some Aspects of the Work of a Municipal Engineer in a Health and Pleasure Resort, by Harry W. Smith, A.M.I.C.E., Borough Engineer, Scarborough.

THE work of the Municipal Engineer in a seaside health and pleasure resort, and the problems with which he has to grapple differ in character and scope from those in inland and industrial towns, and it is the object of the writer to touch briefly upon some of these points of difference.

Of the ordinary routine work of the municipal engineer in the provision of good roads, scavenging, watering, and the disposal of house refuse, sewerage, etc., little need be said, except perhaps that a higher standard is expected in a health and pleasure resort, and that the sewerage problem is generally simplified by the discharge, mainly without treatment, direct into the tideway.

Sea Defence.—The question of sea defence and the retention of sand on the foreshore is an all-important one to many of our seaside resorts, although there are some notable exceptions. One cannot generalise on this subject, and the particular form of defence, whether in the shape of sea wall or groyne, suitable to the needs of the locality can only be arrived at after most careful observation.

Scarborough is a town that is suffering from the inroads of the sea, and a huge sum has been expended in defence works, which are a constant charge for maintenance and repair. The shale sea-bed in the North Bay extending seaward to low-water mark, is eroding at the rate of about 3 ins. per annum. Observations over 30 years show an average lowering in the bay of about

6 ft. The effect of this erosion is to undermine the foundations and endanger the stability of the seawall, and by disturbing the balance of forces cause landslides in the undercliff behind the wall. One of these landslips, of some five acres, is now being dealt with. It extends from the beach to the top of the cliffs, and is threatening the destruction of the roadway and parade. Already it has pushed forward the seawall for a length of 700 ft., a maximum distance in the centre of about 9 ft., tapering off at either end, the sea-bed rising in front. A very heavy sum has already been spent in drainage, buttresses and toes to the sea-wall to arrest the slide, but the problem is not yet solved.

In the South Bay the sand is accumulating, and in 30 years has risen to the extent of some 4 or 5 ft., this being due to the natural protection afforded by the promontory known as the Castle Hill. The direction of the littoral drift is from north to south.

The type of sea-wall to be adopted calls for the most careful consideration. The concave-faced wall, whilst undoubtedly lessening the shock of the waves thrown against it during gales, has proved to be very destructive to the beach at its foot, due to the return water from the wave causing scour. This is particularly so when the wall is reached by the sea at high water.

The writer has had experience of several forms of aprons to withstand this scour, and has recently experimented with a form designed to break up the return wave by a series of steps, which has proved more successful than either sloping or flat aprons.

Groynes have been abandoned at Scarborough as being of little or no practical value.

Bathing Facilities.—In the case of sea bathing, forming as it does, one of the principal items on the programme of the holiday maker, it behoves the municipal engineer to do everything possible to extend the facilities and render safe the lives of those enjoying this health-giving sport.

Tides and currents must be studied, and bathing, so far as possible, rendered fool-proof. Buoys should mark danger spots, and in strong tidal waters there should be an efficient boat patrol, whilst lifebuoys should be placed upon tripods on the beach, so as to be handy for immediate use. As, despite all these precautions, accidents are bound to happen, a central station fitted with all apparatus for first aid to the drowning, and linked up by telephone, is a necessity.

The provision of a bathing pool also makes for safety, and adds to the enjoyment of the bathe. Scarborough has spent a sum of £13,000 on its bathing pool in the South Bay, which has proved to be so successful that it is contemplating the erection of another, at an early date, in the North

Bay. Bathing pools enable better facilities to be obtained for the teaching of swimming, and, by the promotion of galas and aquatic carnivals, add to the interest taken in swimming and afford pleasure to sightseers.

The accommodation for the bather, whether on the beach or in the pool, is worthy of consideration. The day of the old-fashioned chariot on wheels, drawn into the sea by a decrepit horse, is over. Bathing tents and bungalows at the foot of the cliffs have in many towns taken their place. In addition to their use for bathing, they enable families to remain the whole day by the sea, and save a wearisome walk in the hottest part of the day to lodgings for meals, and incidentally they form a source of considerable revenue to the municipality.

A cold shower after a bathe adds to the comfort of the bather, and should be liberally provided. In the case of a bathing pool it is possible to provide warm showers.

Pleasure Grounds.—An up-to-date seaside resort, to properly cater for its visitors, is perforce obliged to provide recreation grounds far in excess of those required for its normal population. Its clients are on health and pleasure bent, and it behoves the municipality to leave no stone unturned to minister to their wants.

The nearer the sea front these facilities are afforded the better, and happy the town that has control of the whole of the land bordering on the sea front ; and if that land consists of undercliff, with ravines or chines, as is the case in Scarborough and Bournemouth, unique opportunities are afforded to the Municipal Engineer not only to enhance the natural beauty of the scenery, but also to afford recreation for both young and old.

Golf, cricket, tennis, bowls, are essential, and if carefully managed should be a source of revenue. As all the patrons of a seaside resort are not active and vigorous and devoted to sports, quiet rest spots amidst beautiful surroundings should not be forgotten. In the laying out of access paths on undercliffs to the sea, regard should be had to the invalids and aged, and paths of easy gradient, without steps, to admit of bath chairs and perambulators should be formed. The planting of an undercliff and sea front, not only to beautify but to form shelter, should be an aim even on the most exposed portions of our coast. Much can be done in this respect. In Scarborough, exposed as it is to the full force of north-east gales, the rose gardens on the undercliff, only a few yards from the sea, are one of its most attractive features. Success in this direction is all a matter of shelter. Advantage must be taken of natural mounds and hollows, and if they do not suffice they can be created artificially, and the shelter thus afforded will enable many of the choicest and tenderest of flowers to be grown, whose brightness will gladden the tired eye of the town dweller, and send him back to work

refreshed in body and mind. The trees and shrubs which flourish by the sea (and their name is legion) will in turn provide the requisite shelter.

In all pleasure grounds and sea fronts a liberal supply of shelters, both from wind and showers, should be provided. The inner man also should not be forgotten, and on suitable sites cafés, where refreshments can be served in the open, or under cover as the state of the weather permits, are extremely desirable. Under careful management they should yield a substantial profit in the way of rental if let to suitable tenants or if worked municipally. Scarborough runs 13 cafés, and has recently installed a bakery and ice cream making plant to ensure its patrons having the food served to them of the purest material prepared under hygienic conditions.

Housing.—One of the phases of the housing problem more especially applying to some of our older seaside health resorts is the growing tendency to convert into flats the older properties, erected 40 or 50 years ago, as lodging houses and private residences, which, at the present day, by reason of the changing habits of visitors and the domestic servant problem, have become out of date and a drug in the market.

Owners have found that by dividing up the various floors into flats or tenements by interior alterations, that to-day there is no difficulty in letting these flats or tenements at a remunerative rental.

Although at the present time of house shortage and high building costs, there may be something to be said in favour of this course, both from the owner's point of view who have turned non-paying property into a paying concern, and from that of the municipality, who benefit by the rates, there is a danger that this converted property, when building becomes cheaper, may gradually deteriorate into aristocratic slums.

In many such conversions the accommodation provided is totally unsuited to the needs of a young family. There is a lack of privacy, whilst kitchen accommodation and provision for the keeping of food is inadequate. The danger from fire in the case of four or five storey houses is increased, whilst from a public health point of view in dealing with the spread of infectious disease, and from a police point of view the conditions are most undesirable.

There are difficulties in bringing such conversions within the scope of existing building by-laws, and a code of model by-laws applicable to such conversions is urgently needed, containing, amongst other provisions, clauses for protection against fire, adequate ventilation of passages and staircases, the cutting off of the flat or tenement from the common stairway, etc. Scarborough is about to draw up such by-laws dealing with these matters.

Notwithstanding the extra duties which a seaside town imposes on its engineer, after all there are undoubted compensations.

Refuse Disposal and Salvage Methods for Small Towns, by J. W. Hipwood, A.M.Inst.C.E., Borough Surveyor and Waterworks Engineer, Newark.

THIS subject has been brought prominently to the attention of the Author on account of the necessity of dealing in a more sanitary and efficient method with the collection and disposal of the house refuse and night soil of the " ancient and loyal " Borough of Newark, with its population of nearly 20,000.

The " loyalty " of the Borough is highly commendable, but the " ancient " methods of disposal into tips near inhabited property, and the presence in the town of several hundreds of old pail closets leaves much to be desired.

In addition to new Sewerage and Conversion Schemes in hand the Council are not only modern enough to realise the disadvantages of the old systems, but have unanimously decided to act as pioneers by the adoption of principles which they feel are up-to-date, sanitary, efficient and economical.

As regards the collection of house refuse, it was realised that a new type of collecting wagon was necessary. A mistake made in the type of wagon in frequent use is its unnecessarily heavy weight.

What is usually needed is a cheap motor vehicle with the minimum of weight and the maximum of capacity, and the type of vehicle adopted by the Author with most satisfactory, hygienic and financial results, is a Ford ton truck mounted with an end tipping body.

The inside body dimensions are 7 ft. 6 in. by 5 ft. 6 in. by 1 ft. 9 in. The capacity is 4 cubic yards, the body has a steel lined bottom with galvanised steel sliding covers in 4 sections and a gravity end tipping gear which allows the load to be completely discharged in 30 seconds the angle of tip being 45 degrees.

The unloaded weight of the wagon is 24½ cwts., and the average weight of refuse removed is 25 cwts., this being the safe working load without putting too much strain on the rear wheel tyres which are N.A.P. pneumatics.

The loading line has been specially designed at 4 ft. 6 in. from the road level, the bodies having 2 let-down doors on each side.

The bodies are easily detachable and are changed every night and morning for night soil tanks, which fulfil their task admirably. The tanks are oval in section, 6 ft. long by 5 ft. 6 in. wide, and 18 in. deep, of ⅛ in. mild steel flanged plates rivetted together and fitted with two manholes with hinged clamped lids and an 8 in. outlet disc valve with gunmetal watertight faces. The loading level is only 4 ft. 1½ in. from the ground. The weight of chassis cab and nightsoil tank is exactly 1 ton, and it carries another ton of nightsoil.

The bodies do not tip, but the floor of the tank slopes 3 in. from front to back.

Collecting costs owing to the change of system have been reduced as follows :—*House Refuse* from 12s. to 7s. 7½d. per ton. *Night Soil* from 21s. to 12s. per ton.

As regards traction costs generally, the Author is of opinion that within a mile of the point of disposal nothing is cheaper than horse traction, within 2 miles electric traction (where available), within 3 miles light petrol, and beyond 3 miles heavy petrol or steam wagons. Mechanical power is only justified when it is continually on the move.

Next as to refuse disposal, from a study of the average analysis of house refuse, and from past experience of destructors, the Author has come to the conclusion that the most satisfactory and sanitary method of dealing with house refuse is to mechanically screen and subsequently sort it, recover all material for which there is a market, and to destroy in an incinerator the component parts of refuse which decompose and give it its characteristic odour.

Analyses in Newark revealed the following percentages :—

	%
3/16 in. cinders to dust	35·00
Cinders	40·00
Tins	2·00
Rags	2·50
Old Iron	·25
Glass (broken)	·25
,, (unbroken)	·75
Paper	3·60
Bones and Shells	·50
Vegetable refuse and debris ...	15·15
	100·00

The weight of house refuse collected daily is 15 tons and of nightsoil 4½ tons.

Concerning Destructors, we must note that the heat from the burning cinders and combustible refuse is practically used for raising the 35 per cent. of fine dust in the refuse to an incandescant heat, which when cool, has to be removed from the cells and flues respectively as clinker and dust and at a heavy cost. The complaints from residents in the neighbourhood of Destructors much more than counterbalance the small advantage of the steam raised. When attached to an Electricity Station, the Electrical Engineer will generally appreciate the absence rather than the presence of a Destructor with its dust and smells and irregular steam production.

To quote from a report of Mr. Sagar, the Cleansing Superintendent of

Halifax, " Refuse Destructors have fulfilled a useful purpose in the last 25 to 30 years, and where cost is no object they may still be regarded as being effective, but their great faults are their costliness and the uselessness of attempting to destroy dust from the house fire grate which is frequently nearly half the total amount of the refuse."

One third to one half of the material taken to a Destructor has to be removed a second time in the form of clinkers, and from various reports of Local Authorities the cost of upkeep and labour ranges between 10s. and 12s. per ton of refuse dealt with.

Refuse tips, although well removed from inhabited districts, are very undesirable from a sanitary point of view. They form an ideal breeding place for rats. The tins keep open ample passages, the hot cinders keep them warm, and the decaying refuse provides their food.

The internal fires are very difficult to eradicate, and, containing so much fuel, may be found on fire as much as 20 ft. below the surface.

With reference to the value of screened refuse, it has been demonstrated the fine dust is an excellent substitute for manure on heavy land and has twice the available nitrogen for manurial value as stable manure. Crops 100 per cent. better than those obtained from the use of stable manure have been obtained.

Where nightsoil also has to be dealt with a 2 to 1 mixture of dust and nightsoil will produce a very rich manure and such that the Author has already received many requests for by those farming heavy lands.

An analysis of this manure, prepared by the Borough Analyst of Halifax, shows the following :—

	Per cent.		Farmyard Manure.
Moisture	40·8	...	(75·5)
Organic matter ...	21·7	...	(16·5)
Mineral Matter ...	13·0	...	(5·3)
Sand	24·5	...	(2·7)
Containing nitrogen ...	2·13	...	(0·59)
Equals ammonia ...	2·59	...	(0·71)
Containing lime ...	1·22	...	(2·28)

Figures in brackets are average constituents of Farmyard Manure.

The manure is very rich in nitrogenous matter, it is free from grease, the presence of 25 per cent. sand would also tend to lighten the soil and is an advantage. Its value based on the ammonia content is about 3½ times that of farmyard manure and about 1/10th that of Ammonium Sulphate.

There should be a very appreciable source of revenue to Local Authorities from the sale. Unwashed cinders have been shown to have a calorific value of 8,000 British Thermal Units per ton or 8/14ths. that of a good coal, and if

washed, 11,000 British Thermal Units. The washing process is not financially practicable for small towns, and prevents the recovery of lumps of coal often found in the refuse.

The most serviceable form for sale is again confined to large towns where, after washing, the cinders are mixed with 6 to 8 per cent. of pitch and pressed into ovoid briquettes having a calorific value of 12,750 British Thermal Units.

The Author proposes to use those recovered in his plant firstly for raising steam to operate the plant and, secondly, for his waterworks pumping station, using forced draught, and also for sale for slow combustion stoves, greenhouses, &c., for which object he has found them admirably suited, especially if mixed with fine slack.

Old tins command the best value in the form of a bale of convenient size and weight. These can be produced by the use of a baler producing self-binding bales 12 ins. cube weighing 50 lbs. each or larger bales 18 in. by 12 in. weighing about 84 lbs.

There is always a good market for scrap metals, bones, rags, glasses and bottles, but the market for paper has gone.

The Author has endeavoured to incorporate the knowledge he has gained into an economic salvage and disposal plant, and having the unanimous and valued support of his Council, is now erecting an installation.

Some elaborate suggestions have been considered, but have finally been rejected when it has been realised that house refuse is an unnatural product and cannot be dealt with in the same way as natural earths or rocks.

What may be eminently suitable for handling, say crushed stone or coal, will fail to give satisfactory results when your materials to be handled vary in size from a matchbox to an old mattress.

The more simple, straightforward and get-at-able the plant, the more successful it is likely to be for a small Borough.

The plans exhibited showed that on arrival at the elevated Tipping Floor, the refuse will be discharged and trimmed by hand labour on to the shoot discharging into the mouth of the Revolving Screen. Large unwieldly articles are picked out and thrown sideways to a shoot direct to the Incinerator area. The screen is of a double barrel type, 5 ft. 9 in. in diameter, 18ft. long and is contained in a dust proof chamber. By its rotation dust and cinders are separated and passed through the mesh of their respective barrels into the concrete collection hoppers situated beneath the screen. This hopper is divided into two compartments, the first to receive the dust, and the second the cinders, the latter having two gradings, the first of which being from 5/16ths. in. up to $\frac{1}{2}$ in. cube, and the second grading over $\frac{1}{2}$ in. and up to $1\frac{3}{4}$ in. cube, the holes being conical.

Steel discharging shoots are fitted to each of the foregoing compartments

to enable the respective screenings to be discharged to the Boiler in the case of the cinders, and that of the dust to the Manure Mixing Mill. Provision is also made that either dust or cinders may be alternatively discharged into small trucks for use elsewhere or for sale.

Tailings passing through the revolving screen gravitate to a Sorting or Picking belt 30 in. wide by 6-ply thick consisting of an endless bitumenised canvas belt for troughing, from which all articles of a saleable nature, consisting of tins, bottles, rags and metal are removed by hand. The canvas belt will be mounted on wrought iron driving, and tension drums 25 ft. centres with intermediate supports of a series of troughing idlers at 5ft. centres. The remaining tailings of a non-saleable nature passing over the end of the Picking Belt into the delivery shoot which discharges tailings into small trucks whence it is wheeled to the Incinerator.

For the production of manure a differential double-shafted mixer has been selected. The body is of cast iron " U " shaped, 6 ft. long by 21 in. wide, inside fitted with cover plate and feeding hopper. The knife shafts are of forged steel 2 5/16ths. ins. square having special cast iron knives running at different speeds.

The supply of night soil is controlled by a lever from a covered night soil hopper as also the delivery from the dust hopper, so that the most desirable proportions of the ingredients of the manure may always be obtained. Delivery of the manure is continuous from the front end of the mixer and will be in the nature of a plastic mass.

The Incinerator will have a capacity for effectively destroying 5 cwt. of refuse, condemned meat and animals, mattresses, offal and vegetable matter per hour, and will contain a cast iron balanced Feeding Door for charging dry refuse, cast iron Feeding Door for charging wet refuse, cast iron Clinker Door and Frame, cast iron Combustion Chamber Door complete with firebrick lining, firebars and bearers, and a 24 ft. high chimney of 3/16 in. mild steelplate. The Incinerator will be supplied with forced draught.

The main building is a skeleton steel framed building fitted with brick panels and abutting on a reinforced concrete retaining wall 18 ft. high faced and encased with concrete blocks and erected by direct labour.

The boiler is of the loco type, having specially large firebox for burning inferior fuel with about 91 tubes of 2½ in. external diameter containing 520 sq. ft. of heating surface, 20 sq. ft. of grate area, capable of evaporating 2,000 lbs. of water per hour.

It was considered a wise expenditure to allow for a Meldrum forced draught arrangement as calculated to give the best results. The engine chosen is a self-contained Vertical Steam Engine of 11 in. diameter cylinder,

14 in. stroke, capable of developing 40 effective h.p. with 100 lbs. of steam, its speed being 175 r.p.m.

The comfort of the employees on the work has been considered by providing lavatories and mess room.

The power estimated to operate each unit is as follows, and by heating coils fixed in the salvage room :—Revolving screen, 7 B.H.P. ; picking belt, 4 B.H.P. ; manure mixer, 10 B.H.P. ; tin baler, 5 B.H.P. ; Total, 26 B.H.P.

So that there is an ample margin of power provided for all processes.

With regard to capital cost, this works out at a total of £4,530, made up of :—Building, land and costs, £1,576 ; roads, &c., £339 ; machinery, £2,615.

As the works were expedited with a view to relieving unemployment, the benefits accruing from section 6 of the Local Authorities (Financial Provisions) Act, 1921, will apply and reduce the charges on the loan very considerably.

It is too early to speak of actual working costs, but it is anticipated that the revenue obtained, combined with the low capital costs, will reduce the call on the rates to a very low figure indeed.

The question of disposal of house refuse by the alternative method of crushing or pulverising was fully considered, but the Author came to the conclusion that apart from the fine dust and night soil, there was little manurial value in the other component parts in the refuse, and that it is preferable to save the energy used and renewals necessary to crush them, and to provide for the destruction by fire of all other organic matter.

Local Authorities should thoroughly investigate the present methods of disposal with a view to reducing the call on their rates, particularly where, on investigation, it can be shown that such economies can be reasonably effected.

THE ROYAL SANITARY INSTITUTE.

FOUNDED 1876.

REVIEWS OF BOOKS.

PULMONARY TUBERCULOSIS.

By Sir James Kingston Fowler, K.C.V.O., C.M.G., M.A., M.D., F.R.C.P., D.Sc.(Hon.). 8vo., 284 pp., illustrated. London: 1921. Macmillan & Co. Price 20s.

The author is one of the most distinguished physicians in this or any country, and is well known for his great knowledge and experience in the diagnosis and treatment of diseases of the chest. His work on "Pulmonary Tuberculosis" is welcomed by all branches of the medical profession, and contains much which will interest the layman, and the patient who is tubercular.

As regards hereditary predisposition to tuberculosis, the author inclines to the opinion that what is transmitted is a general predisposition to disease which belongs to the offspring of weakly parents, and not a special liability to tuberculosis. The frequent occurrence of successive cases of tuberculosis of the lungs in the same family is due to infection in the home.

The tubercular infective agent—the Bacillus Tuberculosis—is undoubtedly widely disseminated in all densely populated areas, and it has been stated that a large proportion (70 to 90 per cent.) of the people who die in middle life or old age from other causes than tuberculosis are found to have obsolete, *i.e.*, cured or arrested tubercular lesions in the lungs or other organs. Sir James quotes his own observations at the Middlesex Hospital, 1879-86, where nearly 2,000 necropsies were made, showing that not 90 but 9 per cent. presented obsolete tubercular lesions in the lungs. Similar observations at the same hospital, in 1890-91, gave a proportion of 9·4 per cent.; whilst during the war, in the Etaples area, B.E.F., France, 1917-18, 2,121 P.M. examinations on men dying from wounds, or some other cause than tuberculosis, showed that 9 per cent. presented obsolete tubercular lesions. That these three records at different dates should exhibit almost an identical figure is very remarkable.

As regards the factors to be considered, when the physician is forming a prognosis (the prospects or otherwise of arrest or cure of the disease) in regard to an individual patient, Sir James places the temperament of the patient in the first and most important position. "No fool," says Sir James, "ever gets rid of tuberculosis of the lungs." He may be no fool in relation to literature, science, or art, but if he is so in relation to his own well-being, he is doomed for certain, no matter what may be the stage of the morbid process or the character of the symptoms. One may be hopeful about the patient who realises that his whole future is at stake, and who will make any sacrifice of any kind in order to regain his health.

Sir James does full justice to the life and work of the great pioneer in the sanatorium treatment of pulmonary tuberculosis—Dr. Otto Walther, who founded the first open-air treatment colony at Nordrach, in the Baden

Black Forest, many years ago. In the opinion of the author, who has been closely associated since their inception with the Frimley Sanatorium of the Brompton Hospital, and the King Edward VII. sanatorium at Midhurst, there has been no failure of the sanatorium system. Sanatoria, rightly administered, have done all that can be expected of them. He agrees with Dr. Bardswell, of King Edward VII. Sanatorium, that the critical time for the patient begins when the sanatorium is left. Success or failure is determined during the next two or three years. This means that in the case of the poorer class of patient sanatorium treatment must be supplemented by an intelligent and beneficent " after care," if most of the good done by sanatorium treatment is not to be thrown away.

The various tuberculosis after-care committees throughout the country are now realising that with the best will possible their efforts are often ineffectual, as advice may be useless unless backed by the power to render actual help, and such help is not forthcoming because there are no funds at the Committee's disposal.

Sir James attaches no value to the injection of tuberculin as a remedy in Pulmonary Tuberculosis. He goes so far as to say that a tuberculosis dispensary which has become a " tuberculin " dispensary has become a very dangerous place. L. C. P.

MENTALLY DEFICIENT CHILDREN : THEIR TREATMENT AND TRAINING.

By G. E. Shuttleworth, B.A., M.D., and W. A. Potts, M.A., M.D. 8vo., 320 pp., illustrated. London, 1922. H. K. Lewis & Co., Ltd. Price 6s. 6d.

In the new edition of the above handbook the authors have provided a concise manual on mentally deficient children, which cannot prove other than instructive to all interested in this subject.

From the etiological and pathological aspect of this condition up to adult life valuable help is given throughout the book in the classification, treatment and education of defectives, based on the findings of many years' personal observation and examination.

Chapters IX. and X., on " Education " and " Industrial Training," are particularly worthy of note, as it is chiefly in this respect that the present education of defectives so frequently falls short of the ideal owing to false restricted facilities for practical training.

The after career of defectives at the present time is recognised as being disappointing, but a study of this book will give valuable information to all on the most suitable methods of education likely to be beneficial to the child and productive of the best results in the future, and as a short manual this book is highly commended and will be found well worth perusal.

G. F. B.

THE MILK SUPPLY : REPORT ON A VISIT TO AMERICAN CITIES IN REGARD TO MILK SUPPLIES.

By John Robertson, C.M.G., O.B.E., M.D., B.Sc., Medical Officer of Health, Birmingham. 8vo., 28 pp. 1922.

The admirable brochure prepared by Dr. John Robertson, M.O.H. for the city of Birmingham, on the milk supply, is one that will be found useful alike by the technical expert and the public. It embodies the results of observations in regard to the milk supplies of American cities recently visited

by Dr. Robertson, Mr. Gurden, representing milk distributors, and Alderman Langford, J.P., representing milk producers.

Dr. Robertson's report points out that while the legal standard in England requires milk to show only 3 per cent. of butter fat, in America 3·25 per cent. is required, and the milk sold generally contains nearly 4 per cent. In America the price of the milk is increased according to the excess of butter fat over the required legal standard. This is certainly an incentive to the producer and the distributor.

Cleanliness in production, storage and distribution of milk is insisted upon in the United States, and if the same bacteriological standards were adopted in this country the result would be to weed out gradually all bad producers and leave in the course of time only producers of first-class milk. Dr. Robertson gives some startling figures with regard to the number of bacteria in milk after milking into an open non-sterile pail as compared with a partly-covered sterile pail, and points out that the cleansing of utensils at farms and dairies in this country, generally speaking, is not thorough. In few instances is there any installation of steam plant, which in the United States is considered an essential, and with this view we are in agreement.

Dr. Robertson also emphasizes that in the United States a properly equipped refrigerator car, supplied with an adequate quantity of ice, is provided by the railway companies for milk transport. What a contrast this is to the method of railway transport in this country! Dirty waggons with doors that can be opened by any railway official, and milk churns with, in many instances, loosely fitting covers allowing dirt free access to the milk, are familiar sights to those with a knowledge of the conditions under which milk is brought from country to town in England.

Dr. Robertson's brochure is one which, with slight modifications, could be adapted as a means of propaganda for a clean milk supply in this country. A knowledge of the facts, as set out in Dr. Robertson's report, if given wide publicity, would do more to educate the people to the necessity and importance of having a clean milk supply than anything else we can think of. We commend the report to all interested in the provision of a better milk supply for the people. G. F. B.

Report of the Hunter District Water Supply and Sewerage Board. By J. B. Henson, A.M.Inst.C.E., Board Engineer. F'cap. 2 Reports and Specification. 1922, Sydney. William Applegate Gullick.

This report, which is accompanied by detailed reports of the Chief Engineer and other officers, includes a very extensive analysis of the water resources in the Hunter Valley of New South Wales.

There are many points of interest raised, and the tables are useful and comprehensive.

The report is accompanied by maps illustrating the water catchment areas, and also the drainage areas of the Sewerage Board, and the tables of pumping values and costs, in which coal, gas and electricity are all included, are very elaborate, but there is a considerable difference in the costs of lifting 1,000 gallons per 100 feet at the various pumping stations. These differences in cost are to some extent explained, and are worthy of note.

Any one engaged upon water supply or sewerage works would be well advised to study the reports in question should they be contemplating Colonial practice. E. W.

The Smokeless City.

By E. D. Simon, M.Inst.C.E., M.I.Mech.E., Lord Mayor of Manchester, and Marion Fitzgerald, A.R.San.I. 8vo., 82 pp. London, 1922. Longmans, Green & Co. Price 1s. 6d.

This book is devoted chiefly to the domestic smoke problem. A chapter is given on the damage done by smoke and an estimate of the yearly cost to Manchester.

The use of statistics to establish a connection between smoke and health is of public value only when they set forth the essential facts, and may otherwise be misleading, and even harmful to the cause advocated. The curve given on page 14, in which days of fog are plotted with the death rate from respiratory diseases for Manchester, is a case in point. A somewhat similar curve was prepared for London by the Advisory Committee on Atmospheric Pollution, and appears in their Seventh Report. This also showed the minimum temperature, and it was at once obvious that the connection between temperature and death rate was closer than between smoke pollution and death rate. The correct conclusion to be drawn was probably, therefore, that the increase of fogs and death rate accompanied low temperature, and these might therefore be expected to show a relation to each other.

Again, the authors' indictment of the coal fire is based not only upon its smoke but on its ventilating effect, which is said to be " to excess " and generally to give " several times as much ventilation as is necessary to health." This is a somewhat dangerous doctrine, and hardly represents the facts, especially when it is remembered that the fire is the only active ventilator in most rooms.

The comparative costs of heating and cooking by coal and gas fires are discussed, and conclusions generally favourable to gas are drawn, except for continuous heating and hot water supply. Heating by slow combustion anthracite stoves is dealt with in one short paragraph, and merits more consideration. Central heating is considered at length, the advantages and drawbacks being set forth as visualised by the authors. A useful summary of the authors' views is given in Chapter 8, and the alternative systems which might be adopted to reduce or abolish smoke are grouped according to the effect desired. The " entirely smokeless " result is obtained by central heating and supplementary gas fires, while other methods aim at reducing but not abolishing smoke.

The book contains much useful data bearing on the domestic smoke problem.

The following paragraph may be quoted as indicating the authors' final conclusion :—

> " There is no service that anybody can render to the cause of smoke abatement that is in any way comparable in importance with effective work for the successful and economical production of good semi-coked coal."

J. S. O.

MEETINGS HELD.

Meat Demonstrations.

Demonstrations in Meat Inspection for a limited number of Inspectors in Office are being held in Birmingham under the direction of the Veterinary Superintendent, Brennan DeVine, F.R.C.V.S., D.V.S.M.

Hull Congress.

The Public Meeting to inaugurate the local arrangements for the Congress was held at the Guildhall, Hull, on January 25th. The Institute was represented by Sir Henry Tanner, C.B., I.S.O., F.R.I.B.A., Mr. H. D. Searles-Wood, F.R.I.B.A., and Prof. Bostock Hill, M.D., M.Sc., F.I.C., D.P.H. The following local officers were appointed: Chairman of the Local General Committee, the Right Hon. the Lord Mayor; Hon. Treasurer, Mr. Thomas G. Milner, F.S.A.A., City Treasurer; Hon. Local Secretaries, Mr. H. A. Learoyd, Town Clerk, and Dr. J. Wright Mason, Medical Officer of Health.

Examinations.

Since the last issue the following examinations have been reported:—

Hobart, Tasmania, October 31st and November 1st, 1922.

Singapore, November 1st to 4th, 1922.

Hereford, January 19th and 20th.

At these examinations 31 candidates presented themselves, and the following were awarded certificates:—

Sanitary Inspectors.

Green, Joseph Albert, *Sorell.*
Keen, Joseph Clement, *Latrobe.*
Orr, Thomas, *Beaconsfield.*
Smith, Alexander, *New Norfolk.*

Sanitary Inspectors in Malaya.

Jacobs, Christian Henry.
Drage, Alexander Warton.
Aiyathurai, George Kulanayagam.

GENERAL NOTES.

List of Members.

A new edition of this list containing the names and addresses of all Fellows, Members and Associates, corrected up to January 1st, 1923, is now in the press. Copies will be ready shortly, price 2s. 6d. Any Member or Associate requiring a copy can obtain it on application to the Institute at half price.

Education in Industry and Commerce.

The Report of the recent meeting of the Association for Education in Industry and Commerce gives an interesting summary of the educational facilities arranged by many large business undertakings for the benefit of their staff. The several programmes shew that while some of the work is directed to special instruction in connection with the business, much of this provision is for the benefit and development of the individual, and includes literature and art as well as domestic and health subjects. In nearly all cases the time occupied is included in the paid work.

FORTHCOMING MEETINGS.

Sessional Meetings.

Birmingham.—Friday, February 2nd, at 7.30 p.m., in the University, Edmund Street. Discussion on "Town and Country Milk Supplies: what is needed for their Improvement," to be opened by John Robertson, C.M.G., O.B.E., M.D., B.Sc., Medical Officer of Health, Birmingham.

The Chair will be taken by Prof. H. R. Kenwood, C.M.G., M.B., F.R.S.E., Vice-Chairman of the Council. Hon. Local Secretary, Dr. John Robertson.

On Saturday, February 3rd, visits will be made to milk plants, where methods of pasteurisation and sterilisation, bottling, etc., will be demonstrated.

Sheffield.—Friday, March 2nd, at 4.30 p.m., in the Town Hall. Discussions on "Extraneous Matters in Food," to be opened by J. Evans, City Analyst, and "The Prevention of Disease by Feeding," to be opened by Prof. E. Mellanby, M.A., M.D. The members will be received and entertained to tea by the Lord Mayor at 4 p.m.

The Chair will be taken by Louis C. Parkes, M.D., D.P.H., Chairman of the Council. Hon. Local Secretary, Prof. F. E. Wynne, M.B., D.P.H., Medical Officer of Health, Sheffield.

On Saturday, March 3rd, visits will be made to the Corporation Sewage Works, and the works of Messrs. Newton, Chambers & Co, at Thorncliffe.

Nottingham.—April 20th and 21st. Discussion on "Local Authorities and the Venereal Diseases Problem." Hon. Local Secretary, P. Boobbyer, M.D., M.S., Medical Officer of Health, Nottingham.

Guildford.—April 27th and 28th. Discussion on "Things that matter in Public Health," to be opened by Sir Arthur Newsholme, K.C.B., M.D., F.R.C.P. Hon. Local Secretary, Joseph Cates, M.D., D.P.H., Medical Officer of Health, Surrey C.C.

Cambridge.—Saturday, June 23rd. Discussion on "The Grading of Milk," to be opened by J. E. Purvis, M.A., with visits in the afternoon to dairy farm producing "certified" milk and to the Field Laboratories. Hon. Local Secretary, A. J. Laird, M.D., D.P.H., Medical Officer of Health, Cambridge.

Ordinary General Meeting.

The Ordinary General Meeting will be held at the Institute on Wednesday, April 25th, at 4.30 p.m.

Congress.

At the invitation of the Lord Mayor and City Council, it has been arranged to hold the 34th Congress and Exhibition of the Institute at Hull from July 30th to August 4th, 1923.

The invitation to appoint Delegates has been issued to all Health Authorities in the United Kingdom, to Dominion, Colonial and Foreign Governments, and to the principal towns in the Dominions and Colonies of the Empire.

Members are asked to help in making the Congress known, and in securing the appointment of Delegates to the meeting.

Examinations.

In Sanitary Science and for various offices in the Public Health Service :—

Preston, Feb. 2nd and 3rd.
Hull, February 9th and 10th.
Plymouth, February, 23rd and 24th.
Regina, Saskatchewan, February.
Aberystwyth, March 9th and 10th.
Bournemouth, March 16th and 17th.
Edinburgh, March 23rd and 24th.
Manchester, April 6th and 7th.

OBITUARY.

Since the publication of the last number of the Journal, notice has been received of the death of the following members, which the Council record with regret :—

Members.—Williams Larkins Bernard, an architect of Bristol. He joined the Sanitary Institute of Great Britain in 1886, and at the Incorporation in 1888 he was transferred as a Life Member of the Institute.

Robert Heath Head, a member of a well-known firm of Surveyors and Architects of Baker Street, London. He had been a member of the Institute since 1896.

T. B. Vakil, an engineer of Bombay, India.

Calendar for February to March.

As far as at present arranged.

FEBRUARY.

2 F. Lecture to Sanitary Officers, at 6 p.m. Public Health (London) Act, etc., by Charles Porter, M.D., B.SC.

2 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Personal Hygiene, Importance of Cleanliness, by J. A. H. Brincker, B.A., M.D., D.P.H.

2 F. } **Sessional Meeting, Birmingham,** in the University, Edmund Street, at 7.30 p.m.
3 S. } Discussion on Town and Country Milk Supplies: what is needed for their improvement, to be opened by John Robertson, C.M.G., O.B.E., M.D., B.SC. M.O.H., Birmingham.

2 F. }
3 S. } Examinations—Preston.

5 M. Lecture to Sanitary Officers, at 6 p.m. Factory and Workshop Acts, Smoke Legislation, Food and Drugs Act, 1899, by Charles Porter, M.D., B.SC.

5 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. The Growth and Development of the Child, by J. A. H. Brincker, B.A., M.D., D.P.H.

6 Tu. Demonstration to Sanitary Officers, at the Public Health Offices, 10, Compton Terrace, Upper Street, Islington, N., at 6 p.m. Book-keeping as carried out in a Sanitary Inspector's Office, by G. Clark Trotter, M.D., D.P.H., M.O.H., Islington.

7 W. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector —A: General, Outdoor, by Charles Porter, M.D., B.SC.

7 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Hygiene of the Special Senses, by Mrs. Margaret C. M. Hogarth, M.B., CH.B.

9 F. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector. —B: General, Indoor, by Charles Porter, M.D., B.SC.

9 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Physical Development, by Mrs. Margaret C. M. Hogarth, M.B., CH.B.

9 F. Lecture to Meat Inspectors, at the Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.S., D.V.S.M. (Vict.), Superintendent, Metropolitan Cattle Market.

9 F. }
10 S. } Examinations—Hull.

10 S. Inspection and Demonstration in the District of Chiswick, at 2.30 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

12 M. Demonstration to Sanitary Officers on Meteorological Instruments in the Parkes Museum, at 5.30 p.m., by the Director, E. White Wallis, F.S.S.

12 M. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector— C: Offensive Trades and Trade Nuisances, etc., by Charles Porter, M.D., B.SC.

12 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Physical Conditions affecting Health in Schools, by Mrs. Margaret C. M. Hogarth, M.B.

14 W. Inspection and Demonstration at L.C.C. Municipal Lodging House, Kemble Street, Drury Lane, W.C., at 2.30 p.m.

14 W. Lecture to Sanitary Officers, at 6 p.m. Elementary Science: Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

14 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Duties and Powers of Health Visitors, by T. Shadick Higgins, M.D., D.P.H., M.O.H., St. Pancras.

16 F. Lecture to Sanitary Officers, at 6 p.m. Elementary Science: Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

16 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Hygiene of the Home, by Miss N. T. F. de Chaumont, ex-Sanitary Inspector, Kensington.

16 F. Lecture to Meat Inspectors at the Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

17 S. Demonstration—Meat Inspectors at Metropolitan Cattle Market, at 12.30 p.m. Conducted by J. R. Hayhurst, M.R.C.V.S.

17 S. Inspection and Demonstration at Schools and Public Buildings, Chiswick, at 2.30 p.m. Conducted by Edward Willis, M.INST.C.E., Engineer and Surveyor, Chiswick.

19 M. Demonstration to Sanitary Officers on Meteorological Instruments in the Parkes Museum, at 5.30 p.m., by the Director, E. White Wallis, F.S.S.

19 M. Lecture to Sanitary Officers, at 6 p.m. Elementary Science: Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

19 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Sociological Conditions, by Miss N. T. F. de Chaumont.

20 Tu. Lecture to Sanitary Officers, at 6 p.m. Elementary Science: Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

21 W. Inspection and Demonstration in the District of Islington, at 2.30 p.m. Conducted by G. Clark Trotter, M.D., D.P.H.

21 W. Lecture to Sanitary Officers, at 6 p.m. Water: Composition, Pollution and Purification, by W. W. Jameson, M.D., D.P.H., M.O.H., Finchley.

21 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Home Visiting and Advice, by Miss N. T. F. de Chaumont.

23 F. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Elementary Statistics, by W. W. Jameson, M.D., D.P.H., M.O.H., Finchley.

23 F. Lecture to Meat Inspectors, at Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

23 F. } Examinations, Plymouth.
24 S. }

24 S. Inspection and Demonstration at Express Dairy Co.'s Farm, Finchley, N., at 2 30 p.m.

26 M. Lecture to Sanitary Officers, at 6 p.m. Infectious Diseases, by James Fenton, M.D., D.P.H., M.O.H., Kensington.

26 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Health Talks and Home Nursing, by Mrs. K. Lomax-Earp.

27 Tu. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Home Economics and Cookery, by Mrs. K. Lomax-Earp.

28 W. Inspection and Demonstration in the District of Chiswick, at 2.30 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

28 W. Lecture to Sanitary Officers, at 6 p.m. Methods of Disinfection, by James Fenton, M.D., D.P.H.

MARCH.

2 F. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Sanitary Appliances, by F. Osborne Smith, F.R.I.B.A.

2 F. } **Sessional Meeting, Sheffield,** in the Town Hall, at 4.30 p.m. Discussions on
3 S } "Extraneous Matters in Food" to be opened by J. Evans, City Analyst, and "The Prevention of Disease by Feeding," to be opened by Prof. E. Mellanby, M.A., M.D.

3 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, at 12.30 p.m.

3 S. Inspection and Demonstration at the Kensington Disinfecting Station, at 2.30 p.m. Conducted by James Fenton, M.D., D.P.H.

5 M. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. House Drainage, by F. Osborne Smith, F.R.I.B.A.

7 W. Inspection and Demonstration at Knight's Soap Works, Silvertown, E., at 2.30 p.m.

7 W. Lecture to Sanitary Officers, at 6 p.m. Details of Plumbers' Work, by Walter Scott.

7 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Water Supply : Fittings and Ventilation in the Home, by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

8 Th. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Ventilation and Warming, by Edward Willis, M.INST.C.E., F.S.I., Engineer and Surveyor, Chiswick.

9 F. Lecture to Meat Inspectors at Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

9 F.
10 S. } Examinations—Aberystwyth.

10 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, at 12.30 p.m.

12 M. Lecture to Sanitary Officers, at 6 p.m. Calculations, Measurements and Plans and Sections, by W. C. Tyndale, O.B.E., M.INST.C.E.

12 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Organisation and Management of Infant Welfare Centres and Clinics, by K. M. Vaughan, L.S.A., D.P.H., Medical Officer, West Islington Infant Welfare Centre.

14 W. Inspection and Demonstration in the District of Islington, at 2.30. Conducted by G. Clark Trotter, M.D., D.P.H.

14 W. Lecture to Sanitary Officers, at 6 p.m. Building Materials, by F. Wilkinson, M.INST.C.E., Engineer and Surveyor, Willesden.

14 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Official and Voluntary Agencies administering to Child Welfare : The Children Act, by K. M. Vaughan, L.S.A., D.P.H.

16 F. Lecture to Sanitary Officers, at 6 p.m. Building Sites, by F. Wilkinson, M.INST.C.E.

16 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by Joseph Cates, M.D., D.P.H., M.O.H., Surrey County Council.

16 F.
17 S. } Examinations—Bournemouth.

17 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, at 12.30 p.m.

17 S. Inspection and Demonstration at the Wimbledon Sewage Disposal Works, at 2.30 p.m. Conducted by A. J. Martin, M.INST.C.E.

19 M. Lecture to Sanitary Officers, at 6 p.m. Sewerage, by A. J. Martin, M.INST.C.E.

19 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by Joseph Cates, M.D., D.P.H.

21 W. Lecture to Sanitary Officers, at 6 p.m. Sewage Disposal, by A. J. Martin, M.INST.C.E.

21 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Tuberculosis, by Joseph Cates, M.D., D.P.H.

23 F.
24 S. } Examinations, including Meat Inspectors, Edinburgh.

LIST OF MEMBERS AND ASSOCIATES

ELECTED JANUARY, 1923.

MEMBERS.

* Sanitary Science Certificate.
w Maternity and Child Welfare Workers' Certificate.
§ Sanitary Surveyors' (India) Certificate.
‡ Sanitary Inspector's Certificate
m Meat Inspector's Certificate.
v Women Health Visitors and School Nurses' Certificate.
s School Hygiene Certificate.

MEMBERS.

5013 1923. Jan. ANAND, Hans Raj, C.E., *Assistant Executive Engineer, IV. Division, Upper Bari Doale Canal, Canal Offices, Amritsar, Punjab, India.*

5014 1923. Jan. *HUNT, Arthur, *8, St. John's Road, Crawley, Sussex.*

5011 1923. Jan. LEIPER, Professor Robert Thomson, M.D., D.SC., *103, Corringham Road, Golders Green, N.W. 11.*

5015 1923. Jan. MASSON, George Henry, M.D., C.M., D.SC., M.R.C.P.(EDIN.), F.R.S.(EDIN.), (*M.O.H.*), *Town Hall, Port of Spain, Trinidad, B.W.I.* (*"Brooklyn," Earls Court Square, S.W. 5.*)

5016 1923. Jan. MOULE, Edward Southall, A.M.INST.M. & C.E., *Borough Surveyor's Dept., Town Hall, New Cross Road, S.E. 14.*

5017 1923. Jan. PRENTICE, Robert Johnston Calder, *Public Works Dept., Pretoria, South Africa.*

5050 1923. Jan. ‡*SELFE, Leonard Frank, *1, Grenaby Road, Croydon.*

5018 1923. Jan. YOULL, Capt. Robert Arnold, M.C., *"Glaholme." Grosvenor Drive, Whitley Bay, Northumberland.*

ASSOCIATES.

5966 1923. Jan. *v*BALL, Miss Margaret, *Courthope, The Avenue, Beckenham.*

5967 1923. Jan. *v*BLISS, Miss Dorothy Florence Maria, *38, Wyndcliffe Road, Charlton, S.E. 7.*

5968 1923. Jan. ‡BROWN, Joseph, *17, Whitehouse Road, Sunderland.*

5969 1923. Jan. *v*CAMBRIDGE, Miss Lilian Elizabeth, *86, Graham Road, Southampton.*

5970 1923. Jan. ‡CHARITY, Arthur William, *29, Brindley Street, Pemberton, Wigan.*

8971 1923. Jan. *v*DRYER, Miss Amy Elizabeth, *Ian Juan, 215, Folkestone Road, Dover.*

8972 1923. Jan. ‡GORNALL, Leslie Ashworth, *"Oakenhead House," Rawtenstall, Lancs.*

8973 1923. Jan. ‡HARRIS, Tom Richard, *10, Khedive Road, Forest Gate, E. 7.*

8974 1923. Jan. *t*HERD, George Victor, *33, Havelock Road, Norwich.*

8975 1923. Jan. *v*HOPE, Miss Fanny, *The Cavell Home, Tombland, Norwich.*

8976 1923. Jan. ‡JOHNSON, Albert, *9, Prospect Terrace, Annfield Plain, Durham.*

8977 1923. Jan. ‡MOSS, Frank Tipples, *Engineer, Surveyor and Sanitary Inspector, Borough Green House, Borough Green, near Sevenoaks.*

8978 1923. Jan. ‡PEARCE, William, *16, Swanspool Parade, Wellingborough, Northants.*

8979 1923. Jan. ‡RABY, Walter Thomas, *32, First Avenue, Manor Park, E. 7.*

8980 1923. Jan. *v*RAWNSLEY, Miss Emily, *11, Perrott Street, Treharris, Glam.*

8981 1923. Jan. *v*RICE, Miss Mildred Adeline, *"St. Ebbes," Marmion Road, Southsea.*

8982 1923. Jan. *v*RYAN, Miss Cirsey Madeline, *Masseuse, West Middlesex Hospital, Isleworth, Middlesex.*

8983 1923. Jan. *v*SALT, Miss Edith, *6, Mill Street, Aston-on-Clun, Salop.*

8984 1923. Jan. ‡SKINNER, Frederick Thomas Edward, *6, Hawthorn Gardens, South Ealing, W. 5.*

8985 1923. Jan. *v*TOMLINSON, Miss Elinor, *29, Montague Road, Uxbridge.*

8986 1923. Jan. *v*TREMBLE, Miss Jessie, *Nurses Cottage, Forest Row, Sussex.*

8987 1923. Jan. ‡*m*WALLS, Harry, *Health Offices, 5, Haywra Crescent, Harrogate.*

8992 1923. Jan. *v*WHYATT, Miss Charlotte Louise, *16, Kirkside Road Blackheath S.E. 3*

8988 1923. Jan. *v*WILKINSON, Miss Florence Beatrice, *14, Albemarle Road, York.*

8989 1923. Jan. *v*WILLIAMS, Miss Olive Mary, *38, Beechley Road, Wrexham, Denbighshire.*

8990 1923 Jan. *v*WILLOUGHBY-LOFTS, Miss Harriette, *1, Templeton Place, Earl's Court, S.W. 5.*

8991 1923. Jan. ‡WOOLFORD, Harry James Thompson, *42, The Parade, Epsom.*

SUPPLIED TO
Metropolitan Water Board
Hastings, Tunbridge Wells, Reading, Harrogate, Pontypridd and Rhondda Joint Water Board, Torquay, Paignton, West Gloucester Water Co., Cromer, Windsor, Truro, Falmouth, Teignmouth, West Cheshire Water Co., Staffordshire Potteries Water Co., Royal Military College, Sandhurst, Chippenham, Barnoldswick, Guernsey States Water Board.

Fitters for WATERWORKS, PUBLIC BATHS, INSTITUTIONS, FACTORIES, COUNTRY HOUSES, Etc.

WATER FILTERS
CANDY
SEWAGE SPRINKLERS

The Best Sewage Sprinkler on the Market.

AUTOMATICALLY CONTROLLED PRESSURE and GRAVITY FILTERS.

Valuable Patented Improvements.

The CANDY FILTER CO., Ltd.,
18, Howick Place,
Westminster, S.W.1.
Telegrams: CIMOLITE, SOWEST, LONDON. 'Phone: VICTORIA 1057.

We are Sanitary Specialists

For many years we have specialised in the design and manufacture of sanitary goods of unquestionable quality. Being the actual manufacturers, we are able to institute such supervision as to ensure a maintenance of our high standards. Our illustrated catalogue gives full information of our many products, and is remarkable for the large number of special designs shewn.

BROADS
BROAD & CO., LTD.
Sanitary Specialists.
Manufacturers of Portland Cement, Bricks, Drain Pipes & Firegoods.
Ironfounders.
4, South Wharf, Paddington, W.2.
Telegrams: Broadsco, London. Telephone: Paddington 6 (3 lines)
Works and Depots also at West Drayton, Hanwell, Hayes, Cliffe, Church Gresley, Blackfriars and Finchley Road.

18-11

IZAL

DISINFECTANT

THE MODERN HIGH-POWER GERMICIDE

WILL NOT DECOMPOSE, AND RETAINS ITS GERMICIDAL ACTION WHEN MIXED WITH

HARD OR POLLUTED WATER, LIMEWASH, URINE AND OTHER ORGANIC FLUIDS.

NEWTON, CHAMBERS & Co., Limited,

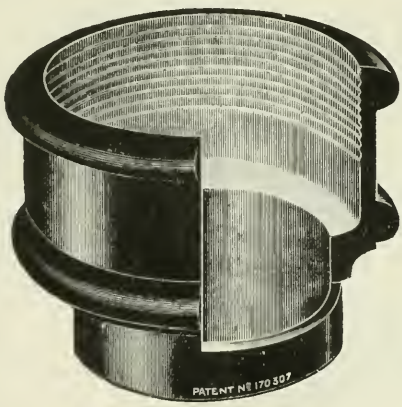
THORNCLIFFE.

NR. SHEFFIELD.

BY APPOINTMENT

IZAL

BURN'S PATENT GROOVED SOCKET SOIL and WASTE PIPES.



Observe corrugations shown in section.

Cast with grooves in the socket, which prevent the lead jointing being withdrawn by expansion and contraction due to variations of temperature or by hot water.

Invaluable for tropical climates.

Internal surface of pipes specially smooth.

Stocked in London County Council weights.

Prices same as for ordinary L.C.C. pipes.

Sole Manufacturers :—

BURN BROTHERS (London) LIMITED,

3, BLACKFRIARS ROAD,

Also at EDINBURGH. **LONDON, S.E. 1.**

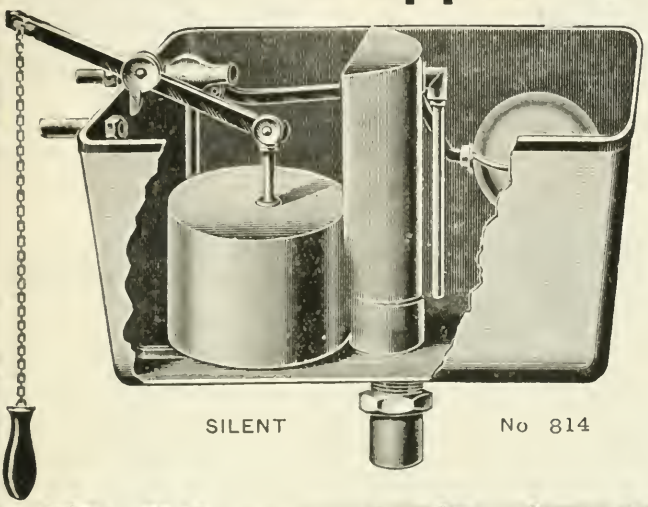
SANITARY ENGINEERS

BY APPOINTMENT

TO HIS MAJESTY THE KING.

Telephone: KENSINGTON 3711 (2 Lines).

Thomas Crapper & Co., Ltd.,



SILENT No 814

120, KING'S ROAD, CHELSEA, LONDON, S.W. 3.

Silent and Easy-Pull Valveless Water Waste Preventers.

BATHS, LAVATORIES, SINKS.

Syphonic, Large-area and other Pedestal Closets. Intercepting Traps. Manhole Covers, etc.

MASTER MINDS

USE

"CHLOROS"

THE

MASTER DISINFECTANT.

CARBOLIC CO-EFFICIENT (Rideal Walker Test) 20.

"CHLOROS" is specially suitable for

Sterilizing Water Supplies and Sewage Works Effluent,

Cleansing and Deodorising Drains, Urinals, Water Closets, and Markets,

Sterilizing Linen and Excreta in Hospitals

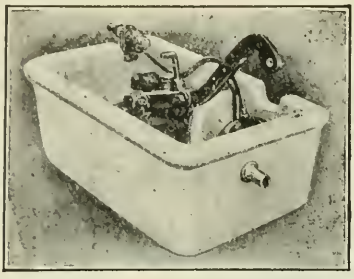
General Disinfection in Schools, Asylums, Hospitals, and Workhouses.

Makers—

The United Alkali Co., Ltd.,

CUNARD BUILDING, LIVERPOOL.

Telegrams: "UBIQUE, LIVERPOOL." Telephone: BANK 9280.



"SWAN" FIRECLAY CISTERN

commended by the Judges BOURNEMOUTH EXHIBITION 1922.

ALL NOISE IN CISTERN DISCHARGE EFFECTIVELY REMOVED by the

"SWAN" SILENCER

Can be fitted to any type of syphon cistern. Price 25/-.

Awarded Bronze Medal, R.S.I. Exhibition Bournemouth, 1922.

TO MANUFACTURERS :— The "Swan" Silencer can be fitted to any type of water waste preventer.

AGENTS WANTED.

HOLTS PATENTS LTD.,

29 & 31, Westmoreland St., Liverpool.

Experts in Rat Destruction

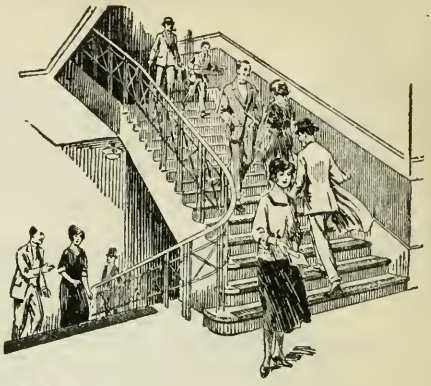
declare that systematic and concerted action with the use of Poison is the only means to effectually deal with the rat pest. Many demand "Rodine" as they declare it ensures success. "I have never known it to fail" writes a Biological Expert. Tins 7½d, 1/3, 2/6 post 3d. 5/- post 6d. Special Discounts on quantities. Write the Maker,

T. HARLEY,

Manufacturing Chemist,

PERTH,———SCOTLAND.

KILLS RATS & MICE



Foot Confidence

One of the first effects of fitting Ferodo Stair Treads on to any stairway is the total absence of accidental falls through slipping.

Then follows a speeding-up of the movements of habitual users—a feeling of confidence is created which puts the balustrade out of commission.

* * *

The perfect non-slip qualities of Ferodo Stair Treads make them the ideal covering for busy staircases. They are made of woven fabric, and they therefore deaden the clatter of footsteps on the stairs. The fabric is firmly woven and chemically treated to give it great durability—actually Ferodo Treads wear longer than cast iron.

Nothing else wears so well.

FERODO

REGISTERED

Patent STAIR TREADS

are not limited to one type of staircase. They are produced in colours and may be fitted to steps of wood, marble, stone or iron. Our Illustrated List gives full description with colours, types and prices. Send for a copy to-day.

FERODO Ltd., Chapel-en-le-Frith.

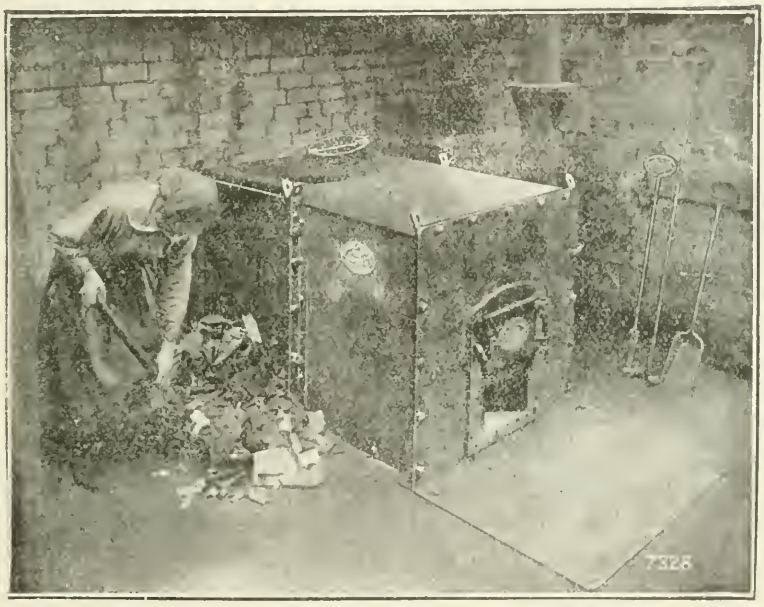
℗28

DESTROY YOUR REFUSE

by means of a

MANLOVE'S INCINERATOR.

Large numbers supplied to Asylums, Hospitals, Sanatoria, Infirmaries, Prisons, Workhouses, Public Institutions, Factories, Hotels, Mansions, etc., etc.



SEMI-PORTABLE TYPE.

Made in various types and sizes. Capacity from ½-cwt. per hour and upwards

Write for List 484

MANLOVE, ALLIOTT & Co., Ltd.

BLOOMSGROVE WORKS,

NOTTINGHAM.

London Office 41 & 42, PARLIAMENT ST., WESTMINSTER, S.W.1.

SHARP, JONES & Co., Ltd., Bourne Valley Works, Parkstone, Dorset.

SALT-GLAZED STONEWARE PIPES AND FITTINGS OF POOLE CLAY.
ROCK-CONCRETE SEWER TUBES FROM 12in. UP TO 6ft. DIAMETER.
ROCK-CONCRETE SEWER MANHOLES WITH PATENT AQUATITE BOTTOM.

GEORGE JENNINGS

Proprietors - - THOS. WRAGG & SONS, LTD.

South-Western Pottery, PARKSTONE, DORSET.

Telegraphic Address "JENNINGS, PARKSTONE." *Tel. No. 6 Parkstone.*

Manufacturers of the Celebrated Poole Stoneware Pipes and Fittings, Glazed Bricks, Building Bricks, Fire Bricks, Sinks, Chimney Pots, Conduits and Troughing for :: :: Electric Cables, etc., etc. :: ::

ACTIVATED SLUDGE PROCESS

The Diffused Air Method

is

THE MOST ECONOMICAL

and

THE MOST EFFICIENT

for the

Purification of Sewage and Trades Waste

Has been adopted by many towns in England, including London, Manchester, (three plants), Worcester, Tunstall, Hanley, Reading, Hertford; also by H. M. War Office, H. M. Office of Works, H. M. Board of Agriculture, Messrs Cadbury Brothers, Ltd., also by towns in India, South Africa, Australia, Canada, France, Denmark, Holland; and other countries.

We have received the Highest Award (Silver Medal) at the Health Exhibition of the Royal Sanitary Institute, held at Birmingham, July-August, 1920.

Write for Leaflet R.S.I.(1).

Address all enquiries to—

Activated Sludge Ltd

14, HOWICK PLACE, VICTORIA STREET, WESTMINSTER, LONDON, S.W.1.

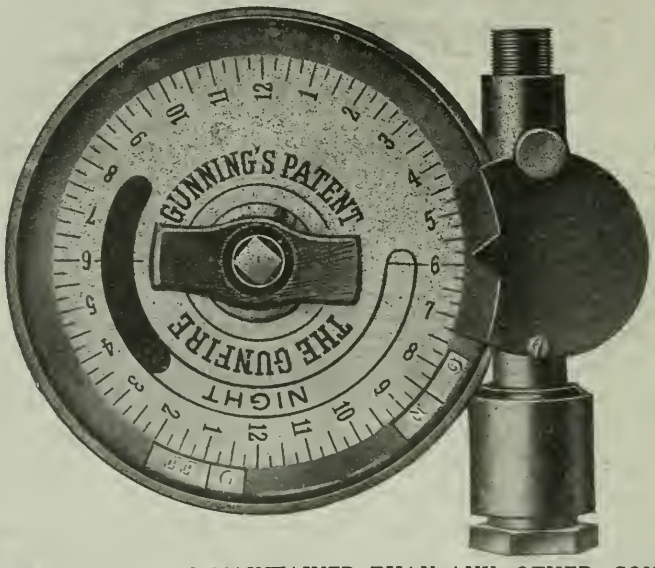
Telegrams:
"ACSLUDGETI, SOWEST, LONDON."

Telephone:
VICTORIA 5945

THE "GUNFIRE"

Is the British Controller and the Pioneer of Automatic Street Lighting.

THE CONTROLLER THAT HAS NEVER BEEN EQUALLED For Efficiency, Quality or Price.



SIMPLER & MORE EASILY MAINTAINED THAN ANY OTHER CONTROLLER.

See our List of Installations. *Hundreds of Towns use them.*

Ask the opinion of users of 20 years' experience.

FOR

CONTROLLING the LIGHTING either GAS or ELECTRIC.

FOR

CONTROLLING the WATER SUPPLY to FLUSHING TANKS.

AWARDED SILVER MEDAL R.S.I. EXHIBITION BOURNEMOUTH 1922.

Fully Guaranteed.

THE BRITISH, FOREIGN AND COLONIAL

Automatic Light Controlling Co., Ltd.,

BOURNEMOUTH.

WIGHTMAN & Co., LTD., "Old Westminster Press," Regency Street, S W 1